A.1 EXECUTIVE SUMMARY LETTER - PRDA Date: February 20, 2001

Program Research and Development Announcement (PRDA) No. DE-RA26-01NT41013 for "Environmental Management Applied Research and Development."

Prospective Offerors:

The purpose of this Executive Summary Letter is to highlight salient elements of the PRDA. This letter is not an integral part of the PRDA which is a self-contained document. In the event of any conflict between the contents of this Executive Summary Letter and that of the PRDA, the PRDA language will prevail.

The National Energy Technology Laboratory (NETL) is soliciting offers for applied research and development (R&D) of innovative and improved technologies that will reduce the cost to, or time to, remediate former weapons complex sites.

Each offer will be objectively reviewed on its own merit against the evaluation criteria stated in the PRDA using technical, scientific and/or peer reviewers, some of whom may be non-Governmental personnel. Should an offeror object to the review of their proposals by individuals other than Government employees it shall so state in Volume I of its proposal. Offerors are, however, cautioned that the DOE may be unable to give full consideration to proposals which indicate that only Government evaluation is authorized.

Individuals, corporations, nonprofit organizations, small and small disadvantaged businesses, educational institutions, and state or local governments or other entities who wish to have a proposal evaluated should respond to the requirements of this PRDA.

Proposals submitted by, or substantially relying upon the technical expertise of, (1) another Federal agency; (2) a Federally Funded Research and Development Center (FFRDC) sponsored by a Federal agency; or (3) a Department of Energy (DOE) Management and Operating (M&O) contractor are not desired, will not be evaluated, and will not eligible for an award under this solicitation. Offerors are encouraged to maximize the use of private sector organizations in the performance of the proposed effort. However, a proposal that includes performance by a FFRDC or DOE M&O contractor(s) may be considered for award, provided that: (1) the proposed use of any such entities is specifically authorized by the cognizant agency for the FFRDC or DOE for DOE M&O contractors, in accordance with the procedures established for the FFRDC or the DOE M&O contractor; (2) the work is not otherwise available from the private sector; and (3) the estimated aggregate cost of the FFRDC or M&O contractor(s) work does not exceed 25 percent of the total estimated project cost. DOE reserves the right to fund the work through a DOE field work proposal or an interagency agreement. If so, DOE will not reimburse the prime contractor or higher-tiered subcontractor, for indirect costs (e.g. overhead and/or G&A) allocated to the FFRDC or M&O subcontract costs.

As a result of this PRDA, the National Energy Technology Laboratory plans to enter into contracts, but reserves the right to enter into grants or cooperative agreements. The requirements of the Federal Acquisition Regulation (FAR) and the Department of Energy Acquisition Regulation (DEAR) will be adhered to for contracts awarded under this PRDA. If a financial assistance award is made, Title 10 of the Code of Federal Regulations, Part 600 will be the governing regulation. The sample contract contained herein is a cost plus fixed fee contract. The model financial assistance agreement can be found at **http://www.netl.doe.gov/business/faapiaf/model.pdf .**

Each proposer's statement of work (SOW) must be structured in phases with logical decision points identified between phases. To maximize the return on its resources, the DOE intends to adopt the use of multiple awards for phased acquisitions. The first phase of the program must be structured as a base contract. Upon completion of the base contract, the DOE will assess the progress of the program and make a determination as to whether it would be in the best interest of the Government to proceed with subsequent phases. Competition on subsequent phases will be restricted to preceding phase contractors. Contractor selections for succeeding phases will be based on technical progress in the current phase, planned activities for the upcoming phase, availability of funds, application of the PRDA program policy factors, and evaluation of the contractor's technical approach. At least 60 days prior to completion of Phase I, contractors will be required to prepare a comprehensive report describing their accomplishments in the current

phase and their plans for the upcoming phase. Article H.23 defines the evaluation process the DOE will utilize to select contractors in subsequent phases.

Assuming the project begins at Stage II (See Section J., Attachment F for definitions of stages), the first phase of each proposal should be moderately priced ideally not exceeding the range of $200,000 to $600,000 with an estimated period of performance of 18 months. This PRDA is intended to fund projects in Stages II and above; therefore, basic research will not be considered. Approximately $12 million is available for awards resulting from this PRDA. In preparing its schedule, each offeror should consider the impact of complying with the National Environmental Policy Act (NEPA) documentation requirements (See Section J, Attachment A, Statement of Work/Program Objectives.) It is anticipated that fulfilling the NEPA requirements could take from 3-6 months for proposed efforts that do not qualify as categorical exclusions. No work that could have an adverse impact on the environment can be initiated prior to the Government's NEPA determination.

Because the purpose of the acquisitions resulting from this PRDA is to facilitate the development of technologies that will be used to cleanup and restore the environment at DOE sites, it may be necessary for DOE to obtain intellectual property rights which are either in addition to or different from those enumerated in Clauses 49-54 of Part II - Section I. This will ensure that the technologies developed will be available for future DOE use in achieving programmatic goals.

DOE's normal policy, relative to the granting of patent rights is well defined: unless restricted by statute. Small businesses, educational institutions, and nonprofit organization, are granted patent rights under work performed for DOE. Others are not. It is DOE's policy, however, to grant advance waivers of patent rights when it is in the Government's best interest. Waivers are often granted when a contractor has substantial involvement in the work being performed and provides cost sharing, normally not less than 20% of the total project cost. This level of involvement by offerors is encouraged. When the DOE supports contractor research, development, and demonstration efforts where the principal purpose is commercialization and utilization of the technologies by the private sector, and when there are reasonable expectations that the contractor will receive present or future economic benefits beyond the current contract as a result of performance of the effort, it is DOE's policy to obtain cost participation. Cost participation may be in various forms or combinations, which include but are not limited to, cash outlays, real property, or interest therein, needed for the project, personal property or services, cost matching or other in-kind participation (reference DEAR Subpart 917.70, titled "Cost participation" for additional information). Offerors who respond to this solicitation and are considering the possibility of broader application of the technologies, beyond DOE's immediate needs, should consider this when preparing their proposal. Furthermore, the extent of cost participation will be considered in the DOE's evaluation of costs as detailed in Article M.4, "Cost."

The Government does not anticipate providing any facilities or property for accomplishing this effort. Offerors are encouraged to propose utilization of existing facilities and to make allowances for providing all necessary personnel, facilities, equipment and materials to complete proposed projects.

Because of the nature of DOE's mission it may be necessary for successful contractors to have access to or produce classified material. Additionally, it may be necessary for contractor personnel to visit classified DOE sites. It is stressed, however, that NO classified material or information is to be submitted with any proposal responding to this PRDA!

Proposals must be prepared and submitted in accordance with the requirements of the PRDA (See Section L). Offerors are also advised to give particular attention to the evaluation criteria identified in Part V, Section M. Each volume of the proposal should be bound separately and clearly labeled. The proposals must be received by the Contract Specialist not later than 4:00 p.m. local prevailing time on **April 10, 2001**, at the address below:

U.S. Department of Energy
National Energy Technology Laboratory-Morgantown Site
ATTN: Ms. Deborah J. Boggs, MS IO7
3610 Collins Ferry Road
Morgantown, WV 26507-0880

Proposals must authorize a period for acceptance by the Government of not less than one hundred eighty (180) calendar days from the date specified for receipt of proposals. Further, you are cautioned that late proposals, modifications, and withdrawals will be treated in accordance with the article in Section L.5 entitled "Instructions to Offerors - Competitive Acquisition."

This PRDA does not commit the Government to pay any cost for the preparation and submission of proposals. It is also brought to your attention that the Contracting Officer is the only individual who can legally commit the Government to the expenditure of public funds in connection with this proposed acquisition. Additionally, NETL reserves the right to select for award or support any, all, portions of, or none of the proposals received in response to this PRDA.

All requests for explanation or interpretation of any part of the PRDA shall be submitted in writing to the Contract Specialist at the aforenoted address. Your electronically submitted questions must be received by the Contract Specialist within 10 calendar days after the issuance of the solicitation to allow sufficient time for a reply to reach all prospective offerors before the submission of their offer. The e-mail address is: **dboggs@netl.doe.gov**. The Government reserves the right not to respond to questions submitted after this period, nor to respond to questions submitted by telephone or in person at any time. All amendments will be posted on the NETL Homepage at "**http://www.NETL.doe.gov/business/solicit/**"; therefore, offerors are encouraged to periodically check the NETL Homepage to ascertain the status of any amendments as hard copies will not be distributed.

For your information, it is recommended that all prospective offerors download a copy of the DOE "Lobbying Brochure" **(http://www.pr.doe.gov/lobbying.html)** which provides a summary of the statutory and regulatory restrictions regarding lobbying activities for Federal contractors and recipients.

Please complete and return the Intention to Propose form found at the end of this document at the earliest practicable date. The Intention to Propose form is contained not only in this file, but on NETL homepage at http://www.NETL.doe.gov/business/index.html under Forms as a Word Perfect (W.P.) 6.1 file entitled [intent.wpd]; this should aid in printing the document. All files are formatted for printing on a postscript type printer.

Please note that an automated document writing system has been used to prepare this document. Each provision in the data base has been assigned a number. Not all of the provisions in the data base have been used in this document; therefore, the numbering may not be continuous.

Points of Contact for the individual needs areas are provided in Section J. All communications concerning this PRDA should cite the PRDA number and be directed to the attention of the Contract Specialist via fax at 304-285-4683, or via E-mail at **dboggs@NETL.DOE.GOV**.

Sincerely,

Original signed by

D. Denise Riggi
Contracting Officer
Acquisition and Assistance Division

Enclosure

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Section

OMB Approval No. 9000-0008

SOLICITATION, OFFER AND AWARD	1. THIS CONTRACT IS A RATED ORDER UNDER DPAS (15 CFR 700) ▶	RATING	PAGE OF PAGES

2. CONTRACT NO.	3. SOLICITATION NO.	4. TYPE OF SOLICITATION	5. DATE ISSUED	6. REQUISITION/PURCHASE NO.
	DE-RA26-01NT41013	☐ SEALED BID (IFB) ☒ NEGOTIATED (RFP)	2/20/01	21-01NT41013.000

7. ISSUED BY	CODE	8. ADDRESS OFFER TO *(If other than Item 7)*
U.S. DOE, National Energy Technology Laboratory P.O. Box 880, Morgantown, WV 26507-0880		

NOTE: In sealed bid solicitations, "offer" and "offeror" mean "bid" and "bidder."

SOLICITATION

9. Sealed offers in original and _____ copies for furnishing the supplies or services in the Schedule will be received at the place specified in Item 8, or if handcarried, in the depository located in _____ until _____ (Hour) local time _____ (Date).

CAUTION — LATE Submissions, Modifications, and Withdrawals: See Section L, Provision No. 52.214-7 or 52.215-1. All offers are subject to all terms and conditions contained in this solicitation.

10. FOR INFORMATION CALL: ▶	A. NAME	B. TELEPHONE NO. *(NO COLLECT CALLS)*			C. E-MAIL ADDRESS
		AREA CODE	NUMBER	EXT.	
	Deborah J. Boggs	304	285-4473		dboggs@netl.doe.gov

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OFFER *(Must be fully completed by offeror)*

NOTE: Item 12 does not apply if the solicitation includes the provisions at 52.214-16, Minimum Bid Acceptance Period.

12. In compliance with the above, the undersigned agrees, if this offer is accepted within _____ calendar days *(60 calendar days unless a different period is inserted by the offeror)* from the date for receipt of offers specified above, to furnish any or all items upon which prices are offered at the price set opposite each item, delivered at the designated point(s), within the time specified in the schedule.

13. DISCOUNT FOR PROMPT PAYMENT *(See Section I, Clause No. 52.232-8)* ▶	10 CALENDAR DAYS %	20 CALENDAR DAYS %	30 CALENDAR DAYS %	CALENDAR DAYS %

14. ACKNOWLEDGMENT OF AMENDMENTS *(The offeror acknowledges receipt of amendments to the SOLICITATION for offerors and related documents numbered and dated:*	AMENDMENT NO.	DATE	AMENDMENT NO.	DATE

15A. NAME AND ADDRESS OF OFFEROR	CODE	FACILITY	16. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER *(Type or print)*

15B. TELEPHONE NUMBER			15C. CHECK IF REMITTANCE ADDRESS IS DIFFERENT FROM ABOVE — ENTER SUCH ADDRESS IN SCHEDULE	17. SIGNATURE	18. OFFER DATE
AREA CODE	NUMBER	EXT.	☐		

AWARD *(To be completed by Government)*

19. ACCEPTED AS TO ITEMS NUMBERED	20. AMOUNT	21. ACCOUNTING AND APPROPRIATION	
22. AUTHORITY FOR USING OTHER THAN FULL AND OPEN COMPETITION: ☐ 10 U.S.C. 2304(c) ( ) ☐ 41 U.S.C. 253(c) ( )		23. SUBMIT INVOICES TO ADDRESS SHOWN IN *(4 copies unless otherwise specified)* ▶	ITEM
24. ADMINISTERED BY *(If other than Item 7)* CODE		25 PAYMENT WILL BE MADE BY CODE	

26. NAME OF CONTRACTING OFFICER *(Type or print)*	27. UNITED STATES OF AMERICA *(Signature of Contracting Officer)*	28. AWARD DATE

IMPORTANT — Award will be made on this Form, or on Standard Form 26, or by other authorized official written notice.

SECTION B - SUPPLIES OR SERVICES AND PRICES/COSTS

B.1 ITEMS BEING ACQUIRED (JAN 1999)

The Contractor shall furnish required personnel, facilities, equipment, material, supplies, and services (except as may be expressly set forth in this contract as furnished by the Government) and shall perform the following items of work:

Item 1 - Research entitled "[TBD]," in accordance with Part III, Section J, Attachment A, Statement of Work.

Item 2 - Reports as prescribed in accordance with Part III, Section J, Attachment B, "Reporting Requirements Checklist."

B.2 ESTIMATED COST AND FIXED FEE (BASE CONTRACT WITH PHASES)

Phase I Base Contract

The total estimated cost plus fixed fee for the work to be accomplished under this contract is:

Total Estimated Cost ---------- $ [TBD]

Fixed Fee ---------- $ [TBD]

Total Estimated Cost Plus Fixed Fee ---------- $ [TBD]

Phase II

Should the Government elect to require the contractor to advance to Phase II, identified in the Statement of Work/Program Objectives, Part III, Section J, Attachment A, the estimated cost and fixed fee will be increased by the following amount:

Total Estimated Cost ---------- $ [TBD]

Fixed Fee ---------- $ [TBD]

Total Estimated Cost Plus Fixed Fee ---------- $ [TBD]

B.3 LIMITATION OF FUNDS -- COST PLUS FIXED FEE (JUNE 1998)

Pursuant to FAR 52.132-22, "Limitation of Funds," total funds in the amount of $[ ] are obligated herewith and made available for payment of allowable costs and fixed fee to be incurred from the effective date of this contract through the period estimated to end [ ].

B.5 DECISION POINT (PHASED SOW)(NOV 1998)

There is a decision point at the conclusion of Phase I of the contract. If at the time of the decision point, the Government determines that it is advantageous to the Government to enter into the subsequent Phase(s), the Contracting Officer will authorize the Contractor to proceed. In the event a determination is made to continue into subsequent phase(s), the Contracting Officer will issue a bilateral contract modification. The estimated cost and fixed fee of the contract will be increased by the amounts established in this Section B for each phase. The period of performance shall be extended in accordance with Article F.1.

SECTION C - DESCRIPTION/SPECIFICATIONS/WORK STATEMENT

C.1 STATEMENT OF WORK (NOV 1997)

The Statement of Work is located in Part III -- Section J, Attachment A to this contract.

C.2 REPORTS (MAY 1998)

Reports shall be prepared and submitted in accordance with the reporting requirements described in Part III -- Section J, Attachment B.

SECTION D - PACKAGING AND MARKING

D.1 PACKAGING (FEB 1999)

Preservation, packaging, and packing for shipment or mailing of all work delivered hereunder shall be in accordance with good commercial practice and adequate to insure acceptance by common carrier and safe transportation at the most economical rate(s).

Except for those reports required by the Reporting Requirements Checklist of the contract, which are coded by A (As required) where the urgency of receipt of the report by the Government necessitates the use of the most expeditious method of delivery, reports deliverable under this contract shall be mailed by other than first-class mail, unless the urgency of the deliverable sufficiently justifies the use of first-class mail. The Contractor shall not utilize certified or registered mail or private parcel delivery service for the distribution of reports under this contract without the advance approval of the Contracting Officer except for those reports coded A.

D.2 MARKING (JAN 1999)

Each package, report or other deliverable shall be accompanied by a letter or other document which:

(1) Identifies the contract by number under which the item is being delivered.

(2) Identifies the deliverable Item Number or Report Requirement which requires the delivered item(s).

(3) Indicates whether the Contractor considers the delivered item to be a partial or full satisfaction of the requirement.

For any package, report, or other deliverable being delivered to a party other than the Contracting Officer, a copy of the document shall be simultaneously provided to the office administering the contract, as identified in Section G of the contract, or if none, to the Contracting Officer.

SECTION E - INSPECTION AND ACCEPTANCE

E.1 INSPECTION (NOV 1997)

Inspection of all items under this contract shall be accomplished by the DOE Contracting Officer's Representative (COR), or any other duly authorized Government representative.

E.2 ACCEPTANCE (MAR 1999)

Final acceptance of all work and effort under this contract (including "Reporting Requirements," if any) shall be accomplished by the Contracting Officer.

E.3 52.246-9 INSPECTION OF RESEARCH AND DEVELOPMENT (SHORT FORM). (APR 1984)

The Government has the right to inspect and evaluate the work performed or being performed under the contract, and the premises where the work is being performed, at all reasonable times and in a manner that will not unduly delay the work. If the Government performs inspection or evaluation on the premises of the Contractor or a subcontractor, the Contractor shall furnish and shall require subcontractors to furnish all reasonable facilities and assistance for the safe and convenient performance of these duties.

SECTION F - DELIVERIES OR PERFORMANCE

F.1 PERIOD OF PERFORMANCE

The period of performance is the period of time beginning with the execution of the contract and ending at the completion of all work under the base contract, including the preparation and submission of all required reports.

In the event a determination is made to continue into subsequent phases, the period of performance shall be extended as set forth below:

Phase I Base Contract.....[TBD] Months
Phase II.....[TBD] Months
etc.

F.2 PRINCIPAL PLACE OF PERFORMANCE (FEB 1998)

The principal place of performance under this contract shall be at the Contractor's facility located in [TBD].

F.3 52.242-15 STOP-WORK ORDER. (AUG 1989) -- ALTERNATE I (APR 1984)

(a) The Contracting Officer may, at any time, by written order to the Contractor, require the Contractor to stop all, or any part, of the work called for by this contract for a period of 90 days after the order is delivered to the Contractor, and for any further period to which the parties may agree. The order shall be specifically identified as a stop-work order issued under this clause. Upon receipt of the order, the Contractor shall immediately comply with its terms and take all reasonable steps to minimize the incurrence of costs allocable to the work covered by the order during the period of work stoppage. Within a period of 90 days after a stop-work is delivered to the Contractor, or within any extension of that period to which the parties shall have agreed, the Contracting Officer shall either -

(1) Cancel the stop-work order; or

(2) Terminate the work covered by the order as provided in the Default, or Termination clause of this contract.

(b) If a stop-work order issued under this clause is canceled or the period of the order or any extension thereof expires, the Contractor shall resume work. The Contracting Officer shall make an equitable adjustment in the delivery schedule, the estimated cost, the fee, or a combination thereof, and in any other terms of the contract that may be affected, and the contract shall be modified, in writing, accordingly, if -

(1) The stop-work order results in an increase in the time required for, or in the Contractor’s cost properly allocable to, the performance of any part of this contract; and

(2) The Contractor asserts its right to the adjustment within 30 days after the end of the period of work stoppage; provided, that, if the Contracting Officer decides the facts justify the action, the Contracting Officer may receive and act upon the claim submitted at any time before final payment under this contract.

(c) If a stop-work order is not canceled and the work covered by the order is terminated for the convenience of the Government, the Contracting Officer shall allow reasonable costs resulting from the stop-work order in arriving at the termination settlement.

(d) If a stop-work order is not canceled and the work covered by the order is terminated for default, the Contracting Officer shall allow, by equitable adjustment or otherwise, reasonable costs resulting from the stop-work order.

SECTION G - CONTRACT ADMINISTRATION DATA

G.1 CORRESPONDENCE PROCEDURES (FEB 2000)

To promote timely and effective administration, correspondence (except for invoices and reports) submitted under this contract shall be subject to the following procedures:

(a) Technical Correspondence

Technical correspondence (as used herein, this term excludes technical correspondence where patent or technical data issues are involved and correspondence which proposes or otherwise involves waivers, deviations, or modifications to the requirements, terms, or conditions, of this contract) shall be addressed to the DOE Contracting Officer's Representative, with an information copy of the correspondence to the DOE Contract Specialist.

(b) Property Correspondence

Property correspondence (as used herein, this term includes correspondence which addresses matters which relate to property issues which come under the contract's Government property provisions) shall be addressed to the DOE Property Administrator, with information copies of the correspondence to the DOE Contracting Officer's Representative and the DOE Contract Specialist.

(c) Indirect Rate Correspondence

All correspondence relating to the establishment, revision, and negotiation of billing and final indirect cost rates shall be addressed to the Contracting Officer for Indirect Cost Rate Management, with information copies of the correspondence to the DOE Contract Specialist.

(d) Correspondence on Patent or Technical Data Issues

Correspondence concerning patent or technical data issues shall be addressed to the Office of Intellectual Property Law, U.S. Department of Energy, Chicago Operations Office, 9800 South Cass Avenue, Building 201, Argonne, IL 60439.

Information copies of correspondence being sent to the Intellectual Property Law Division shall also be sent to the NETL Patent Attorney, the DOE Contract Specialist, and the Contracting Officer's Representative.

(e) Other Correspondence

All other correspondence shall be addressed to the DOE Contract Specialist with information copies of the correspondence to the DOE Contracting Officer's Representative.

(f) Subject Line(s)

All correspondence shall contain a subject line commencing with the contract number, i.e., DE-AC26-00NT[ ], and identifying the specific contract action requested.

G.2 SUBMISSION OF VOUCHERS/INVOICES (NOV 2000)

(a) Voucher Form (SF 1034)

In requesting reimbursement, contractors shall use Standard Form 1034 (Public Voucher for Purchases and Services Other Than Personal), and F4220.50 (Statement of Cost). Electronic versions of the SF1034 and the F4220.50 can be found on the NETL website at http://www.netl.doe.gov/business/forms/forms.html. The

Statement of Cost shall be supported by the information contained in Paragraph (c) of this clause. Acceptable substitutes for the forms (which provide the same necessary information) may be used.

In accordance with FAR 52.232-25, "Prompt Payment," all invoices shall include the following information:

(1) Name and address of contractor/vendor
(2) Invoice date
(3) Contract number or other authorization for delivery of property or service
(4) Description, price and quantity of property and services actually delivered or rendered
(5) Shipping and payment terms
(6) Name (where practicable), title, phone number and complete mailing address of responsible official to whom payment is to be sent (must be the same as that in the contract or in a proper notice of assignment)
(7) Name (where practicable), title, phone number and complete mailing address of the person to be notified in the event of a defective invoice.
(8) Other substantiating documentation or information as required by the contract.

(b) Statement of Cost

The SF 1034 shall be completed so as to make due allowances for the Contractor's cost accounting system. The costs claimed shall be only those recorded costs (including cost sharing) which are authorized for billing by the payment provisions of this contract. If this is a cost-plus-fixed-fee contract, the amount claimed for the fixed fee should be based on a percentage of completion of the work. If this is a cost sharing contract, the "Government Share" must agree with the amount billed on the SF 1034. Any cost sharing or in-kind contributions incurred by the Contractor and/or third party during the billing period must be included in the invoice and adequately supported. Indirect rates claimed shall be billed in accordance with the "Allowable Cost and Payment Clause." The Certification (block 11) must be signed by a responsible official of the Contractor.

(c) Supporting Documentation

Direct costs (e.g., labor, equipment, travel, supplies, etc.) claimed for reimbursement on the Statement of Cost must be adequately supported. The level of detail provided must clearly indicate where the funds were expended. For example, support for labor costs must include the labor category (e.g., program manager, senior engineer, technician, etc.) the hourly rate, and the labor cost per category; equipment costs must be supported by a list of the equipment purchased, along with the item's cost; supporting data for travel must include the destination of the trip, number and labor category of travelers, transportation costs, per diem costs, and purpose of the trip; and supplies should be categorized by the nature of the items (e.g., office, lab, computer, etc.) and the dollar amount per category.

Indirect rates used for billings must be clearly indicated, as well as their basis of application. When the cognizant Administrative Contracting Officer (ACO) or auditor approves a change in the billing rates, include a copy of the approval.

(d) Submission of Voucher

Submit one copy of the original voucher including the certified Statement of Cost and Supporting Documentation to the following payment office:

U. S. Department of Energy
Oak Ridge Financial Services Center
P. O. Box 4787
Oak Ridge, TN 37831

In addition, submit two copies of the voucher including the certified Statement of Cost and Supporting Documentation to the following address:

U. S. Department of Energy
National Energy Technology Laboratory
ATTN: Accounts Payable, MS A-10
Morgantown, WV 26507-0880

(e) Billing Period

Vouchers shall be submitted no more frequently than monthly (unless prior written consent of the Contracting Officer for more frequent billing is obtained). The period of performance covered by vouchers should be the same as covered by any required monthly technical progress reports and/or monthly cost reports.

(f) Payment Method

In accordance with Mandatory Information for Electronic Funds Transfer Payment, payment under this contract will be made utilizing the Automated Clearing House (ACH) network. The payment system is specifically referred to as "Vendor Express."

(g) Defective Invoices

Invoices that are determined to be defective, and therefore not suitable for payment, shall be returned to the Contractor as soon as practicable, specifying the reason(s) why the invoice is not proper.

(h) Status of Payments

The Oak Ridge Financial Service Center (ORFSC) has a system via Internet, in which contractors can request information about payments by invoice, by contract number, and/or by paid date. The system is called Vendor Inquiry Payment Electronic Reporting System (VIPERS) and is available to contractors at the following website: http://finweb.oro.doe.gov/vipers.htm. Contractors must have a federal tax identification number (TIN) and then obtain a personal identification number (PIN) to access the system.

G.3 NOTICE OF INVOICE PROCESSING BY SUPPORT CONTRACTOR (DEC 1999)

A support service contractor performs the function of processing of all invoices submitted to the National Energy Technology Laboratory, against its awards. Therefore, this contractor has access to your business confidential cost/rate information. A special provision in this contractor's award requires the confidential treatment by all contractor employees of any and all business confidential information of other contractors and financial assistance recipients to which they have access.

SECTION H - SPECIAL CONTRACT REQUIREMENTS

H.1 CONSECUTIVE NUMBERING (JAN 1999)

Due to automated procedures employed in formulating this document, clauses and provisions contained within it may not always be consecutively numbered.

H.2 TECHNICAL DIRECTION (JUNE 1998)

(a) Performance of the work under this contract shall be subject to the technical direction of the Contracting Officer's Representative (COR). The term "technical direction" is defined to include, without limitation:

(1) Directions to the Contractor which redirect the contract effort, shift work emphasis between work areas or tasks, required pursuit of certain lines of inquiry, fill in details or otherwise serve to accomplish the contractual Statement of Work.

(2) Provision of written information to the Contractor which assists in the interpretation of drawings, specifications or technical portions of the work description.

(3) Review and, where required by the contract, approval of technical reports, drawings, specifications and technical information to be delivered by the Contractor to the Government under the contract.

(b) Technical direction must be within the scope of work stated in the contract. The COR does not have the authority to, and may not, issue any technical direction which:

(1) Constitutes an assignment of additional work outside the Statement of Work;

(2) Constitutes a change as defined in the contract clause entitled "Changes";

(3) In any manner causes an increase or decrease in the total estimated contract cost, the fixed fee (if any), or the time required for contract performance;

(4) Changes any of the expressed terms, conditions or specifications of the contract; or

(5) Interferes with the Contractor's right to perform the terms and conditions of the contract.

(c) All technical directions shall be issued in writing by the COR.

(d) The Contractor shall proceed promptly with the performance of technical directions duly issued by the COR in the manner prescribed by this clause and within the authority under the provisions of this clause. If, in the opinion of the Contractor, any instruction or direction by the COR falls within one of the categories defined in (b)(1) through (5) above, the Contractor shall not proceed but shall notify the Contracting Officer in writing within five (5) working days after receipt of any such instruction or direction and shall request the Contracting Officer to modify the contract accordingly. Upon receiving the notification from the Contractor, the Contracting Officer shall:

(1) Advise the Contractor in writing within thirty (30) days after receipt of the Contractor's letter that the technical direction is within the scope of the contract effort and does not constitute a change under the "Changes" clause of the contract; or

(2) Advise the Contractor within a reasonable time that the Government will issue a written change order.

(e) A failure of the Contractor and Contracting Officer to agree that the technical direction is within the scope of the contract, or a failure to agree upon the contract action to be taken with respect thereto shall be subject to the provisions of the clause entitled "Disputes - Alternate I".

H.3 MODIFICATION AUTHORITY (NOV 1997)

Notwithstanding any of the other provisions of this contract, the Contracting Officer shall be the only individual authorized to:

(a) accept nonconforming work,

(b) waive any requirement of this contract, or

(c) modify any term or condition of this contract.

H.4 GOVERNMENT PROPERTY AND DATA - NONE (NOV 1997)

The Government is not obligated to furnish any real or personal property or data under this contract, and the Contractor is not authorized to acquire any real or personal property or data at the Government's expense under this contract.

H.5 GOVERNMENT PROPERTY AND DATA (JAN 1999)

(a) Except as otherwise authorized by the Contracting Officer in writing, the Contractor is not authorized to acquire as a direct charge item under this contract any equipment (including office equipment), furniture, fixtures or other personal property items.

(b) Acquisition Authorization Requirements

(1) In the course of performance of this contract, the Contractor may only acquire and direct charge to this contract such items on the "List of Government Property -- Contractor Acquired" (Part III -- Section J, Attachment C to this contract.

(2) The Contractor may request authorization for acquisition of additional items from the Contracting Officer. Any such request shall include an analysis of the most economical method of acquisition (e.g., lease versus purchase) and shall describe the material equity arising from any proposed lease arrangement, such as option credits.

(3) Any changes in the acquisition authorization shall be reflected in a modification to this contract which revises the "List of Government Property -- Contractor Acquired" (Part III -- Section J, Attachment C to this contract.

(4) Authorization to acquire does not constitute consent to the placement of a subcontract.

(c) Government-Furnished Property and Data

Except as otherwise authorized by the Contracting Officer in writing, only that property and data specifically included in the "List of Government-Furnished Property" (Part III -- Section J, Attachment D to the contract, shall be furnished.

(d) Reporting Requirements

The reports required shall be submitted in accordance with 48 CFR 945 and the reporting requirements set forth in Part III, Section J, Attachment B.

The reports are to include all capital equipment and sensitive items acquired or furnished under this contract, whether or not listed on the attachments referenced above.

H.6 TITLE TO EQUIPMENT (GOVERNMENT) (APR 1998)

Pursuant to the clause of this contract entitled "Government Property (Cost-Reimbursement, Time-and-Materials, or Labor-Hour Contracts) --Alternate I ," title to equipment having an acquisition cost of $5,000 or more, purchased with funds available for research and approved by the Contracting Officer prior to acquisition, shall vest with the Government.

H.7 KEY PERSONNEL/PROGRAM MANAGER (MAR 1998)

The key personnel, which includes the Program Manager, specified below, are considered to be essential to the work being performed under this award; moreover, any changes to these personnel require prior DOE Contracting Officer's written approval.

The Program Manager shall serve as the Contractor's authorized supervisor for technical and administrative performance of all work hereunder. The Program Manager shall receive and execute, on behalf of the Contractor, such technical directions as the DOE Contracting Officer's Representative may issue within the terms and conditions of the contract.

The following is a list of key personnel that have been approved for this contract:

Name	Title
[TBD]	[TBD]

Prior to diverting any of the specified individuals, the Contractor shall notify the Contracting Officer not less than thirty (30) calendar days prior to the diversion or substitution of key personnel and shall submit a written justification (including qualifications of proposed substitutions) to permit evaluation. The proposed changes will be approved in writing at the sole discretion of the Contracting Officer, with concurrence of the Contracting Officer's Representative.

H.8 TRAVEL AND PER DIEM COSTS (FEB 1998)

Costs incurred by contractor personnel for travel, including costs of lodging, other subsistence, and incidental expenses, shall be considered to be reasonable and allowable only to the extent that they do not exceed the rates and amounts set by Subchapter I of Chapter 57 of Title 5, United States Code, or by the Administrator of General Services or the President (or his designee) pursuant to any revision of such subchapter; and are allowable pursuant to the "Allowable Cost and Payment" clause, FAR 52.216-7.

Foreign travel shall be subject to DEAR 952.247-70.

H.9 TRAVEL (EDUCATIONAL INSTITUTIONS) (SEPT 1998)

Costs incurred by contractor personnel for travel, including costs of lodging , other subsistence, and incidental expenses, shall be considered to be reasonable and allowable only to the extent that they do not exceed the charges normally allowed by the Contractor's institutional travel policy and are in accordance with the limits and principles set by the OMB Circular A-21 for such costs.

H.10 PRIOR APPROVAL REQUIREMENTS FOR PLACEMENT OF SUBCONTRACTS/CONSULTANTS (OCT 1998)

The Contractor shall obtain the Contracting Officer's written consent before placing any subcontract, including consultants, for which advance notification is required under FAR 52.244-2, "Subcontracts".

Any request for subcontract/consultant approval shall include the elements prescribed by FAR 52.244-2, including subcontractor/consultant Representations and Certifications. For consultants the Contractor will obtain and furnish information supporting the need for and selection of such consultant services and the reasonableness of the fees to be paid, including, but not limited to, whether fees to be paid to any consultant exceed the lowest fee charged by such consultants to others for performing consulting services of a similar nature.

Except as may be expressly set forth therein, any consent by the Contracting Officer to the placement of subcontracts and/or consultants shall not be construed to constitute approval of the subcontractor or any subcontract terms or conditions, determination of the allow ability of any cost, revision of this contract or any of the respective obligations of the parties thereunder, or creation of any subcontractor privity of contract with the Government.

The Contractor is hereby given consent to the placement of the following subcontractors, which were evaluated during negotiations:

[TBD]

Notwithstanding this consent, the Contractor shall ensure compliance with FAR 52.244-2. Also, since these subcontracts and/or consultants have as a purpose the conduct of research, development and demonstration work, they must additionally contain all applicable flow-down clauses contained in Part II, Section I.

H.11 SUBCONTRACTOR FACILITIES CAPITAL COST OF MONEY (FEB 1998)

(a) To the extent a subcontractor proposes to recover as an element of proposed cost any Facilities Capital Cost of Money (FCCOM) from a higher tier subcontractor or from the prime contractor, the FCCOM cost principle (FAR 31.205-10) shall apply to subcontracts and new scope modifications issued thereto which are fee bearing cost reimbursement type or negotiated fixed price type.

(b) To the extent a subcontractor is eligible to recover yet does not propose as an element or proposed cost any Facilities Capital Cost of Money (FCCOM) from a higher tier subcontractor or from the prime contractor, the higher tier subcontractor or the prime contractor shall insert the following provision in any such subcontract or new scope modification issued thereto:

Waiver of Facilities Capital Cost of Money
(FAR 52.215-17, OCT 1997)

The Contractor did not include facilities capital cost of money as a proposed cost of this contract. Therefore, it is an unallowable cost under this contract.

(c) The Contractor agrees to insert the substance of this clause, including this paragraph (c) altered as necessary for proper identification of the parties, in any subcontract placed hereunder which is a fee bearing cost reimbursement or negotiated fixed price type.

H.12 CONFIDENTIALITY OF INFORMATION (MAY 1998)

To the extent that the work under this contract requires that the Contractor be given access to confidential or proprietary business, technical, or financial information belonging to the Government or other companies, the Contractor shall, after receipt thereof, treat such information as confidential and agree not to appropriate such information to its own use or to

disclose such information to third parties unless specifically authorized by the Contracting Officer in writing. The foregoing obligations, however, shall not apply to:

(a) Information which, at the time of receipt by the Contractor, is in the public domain;

(b) Information which is published after receipt thereof by the Contractor or otherwise becomes part of the public domain through no fault of the Contractor;

(c) Information which the Contractor can demonstrate was in his possession at the time of receipt thereof and was not acquired directly or indirectly from the Government or other companies;

(d) Information which the Contractor can demonstrate was received by it from a third party who did not require the Contractor to hold it in confidence.

The Contractor shall obtain the written agreement, in a form satisfactory to the Contracting Officer, of each employee permitted access, whereby the employee agrees that he will not discuss, divulge or disclose any such information or data to any person or entity except those persons within the Contractor's organization directly concerned with the performance of the contract.

The Contractor agrees, if requested by the Government, to sign an agreement identical, in all material respects, to the provisions of this clause, with each company supplying information to the Contractor under this contract, and to supply a copy of such agreement to the Contracting Officer. From time to time upon request of the Contracting Officer, the Contractor shall supply the Government with reports itemizing information received as confidential or proprietary and setting forth the company or companies from which the Contractor received such information.

The Contractor agrees that upon request by DOE it will execute a DOE-approved agreement with any party whose facilities or proprietary data it is given access to or is furnished, restricting use and disclosure of the data or the information obtained from the facilities. Upon request by DOE, such an agreement shall also be signed by Contractor personnel.

This clause shall flow down to all subcontracts.

H.13 REPRESENTATIONS, CERTIFICATIONS AND OTHER STATEMENTS OF THE OFFEROR (JUNE 1998)

The Representations, Certifications and Other Statements of the Offeror for this contract are hereby incorporated by reference.

H.14 INDIRECT COSTS (NOV 1997)

Pending establishment of final indirect cost rates for any period, billing and reimbursement of indirect costs shall be made on the basis of provisional rates recommended by the cognizant Government auditor. When a rate change occurs, and after it has been audited and approved by the cognizant Government auditor, the contractor shall inform the Contracting Officer by letter of the indirect rate change. This notification shall include a copy of the cognizant auditor's approval and the cost impact of the rate change on the program.

H.15 GUARANTEED FINAL REPORT (NOV 1997)

Notwithstanding the applicable cost principles of the Federal Acquisition Regulation (FAR) and the DOE Acquisition Regulation (DEAR) in effect on the date of this contract, and as authorized by Paragraph (a) of the clause of this contract entitled "Allowable Cost and Payment," the contractor agrees to manage this contract in such a manner so as to guarantee to the Government the delivery of an acceptable Final Report. It is the contractor's responsibility to ensure at all times that adequate funds remain to cover all allowable costs necessary for the preparation and delivery of the acceptable Final Report.

All costs incurred by the contractor during preparation and delivery of the acceptable Final Report that are in excess of the funds remaining in the contract shall be borne by the contractor.

H.16 COMPLIANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL REQUIREMENTS (FEB 1998)

In performing work under this contract, the Contractor shall comply with all relevant federal, state, and local statutes, ordinances, laws, and regulations.

H.17 NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) -- PRIOR APPROVALS (JAN 2000)

The National Environmental Policy Act of 1969 (NEPA) requires that all Federal agencies consider the impacts of their projects on the human environment. As part of the DOE's NEPA requirements, the Contractor shall be required to supply to the DOE certain environmental information. DOE funds may only be expended by the Contractor on [INSERT ACTIVITIES THAT CAN BE PERFORMED UNTIL THE NEPA DOCUMENT IS SIGNED, i.e., preliminary designs or drawings] activities, until DOE notifies the Contractor that all NEPA requirements have been satisfied.

H.18 CONTRACTOR PRESS RELEASES (APR 1998)

The DOE policy and procedure on news releases requires that all Contractor press releases be reviewed and approved by DOE prior to issuance. Therefore, the Contractor shall, at least ten (10) days prior to the planned issue date, submit a draft copy to the Contracting Officer of any planned press releases related to work performed under this contract. The Contracting Officer will then obtain necessary reviews and clearances and provide the Contractor with the results of such reviews prior to the planned issue date.

H.19 PERMITS AND LICENSES (JAN 1999)

Within sixty (60) days of award, the Contractor shall submit to the DOE Contracting Officer Representative (COR) a list of ES&H approvals that, in the Contractor's opinion, shall be required to complete the work under this award. This list shall include the topic of the approval being sought, the approving authority, and the expected submit/approval schedule. The COR shall be notified as specific items are added or removed from the list and processed through their approval cycles.

The Contractor agrees to include this clause in their first-tier subcontracts and agrees to enforce the terms of this clause.

H.20 QUALITY ASSURANCE/QUALITY CONTROL (JUNE 1998)

The Contractor shall implement the DOE work using Quality Assurance/Quality Control measures as appropriate to:

(a) Achieve accuracy, precision, and reproducibility of data adequate to fulfill the objectives of the work to be performed under this award;

(b) Control experimental operations using accepted technical standards, instruction, and other appropriate means commensurate with the complexity and the risk of the work;

(c) Identify, control and maintain components, equipment, facilities, hardware and materials;

(d) Control handling, storage, shipping. Cleaning and preservation to prevent damage, loss or deterioration;

(e) Control calibration, maintenance, accountability, and use of measuring and testing equipment used for monitoring and data collection;

(f) Ensure that designs use sound engineering/scientific principles and appropriate standards and demonstrate that equipment and processes performed as intended;

(g) Ensure that purchased items and services meet established specifications and requirements;

(h) Incorporate inspections as appropriate;

(i) Continually improve the quality of the work done for DOE through the improvement of work practices guided by internal performance assessment.

H.21 SAFETY & HEALTH AND ENVIRONMENTAL PROTECTION (JUNE 1998)

(a) The Contractor shall implement the DOE work in accordance with all applicable Federal, State and local law as, including codes, ordinances and regulations, covering safety, health and environmental protection.

(b) The Contractor agrees to include paragraph (a) of this clause in first-tier subcontracts and agrees to enforce the terms of this clause.

H.22 CONTRACTOR LICENSING (APR 1998)

(a) Limited Rights Data Or Restricted Computer Software

Except as may be otherwise specified in this contract as data not subject to this paragraph, the contractor agrees that upon written application by DOE, it will grant to the Government for purposes of practicing [TBD], by or for the Government for the purpose of remediation or decontamination of chemically contaminated or radioactive sites, a nonexclusive license in any limited rights data or restricted computer software on terms and conditions reasonable under the circumstances including appropriate provisions for confidentiality; provided, however, the contractor shall not be obligated to license any such data or software if the contractor demonstrates to the satisfaction of the Director of Environmental and Waste Management or designee that such data are being supplied by the contractor or its licensees in sufficient quantity and at reasonable prices to satisfy DOE needs, or the contractor or its licensees have taken effective steps to so supply such data in the form of results obtained by its use.

(b) Background Patents

"Background Patent" means a domestic patent covering an invention or discovery which is not a subject invention and which is owned or controlled by the contractor at any time through the completion of this contract, infringement of which cannot reasonably be avoided upon the practice of any specific process, method, machine, manufacture or composition of matter (including relatively minor modifications thereof) which is a subject of the research, development, or demonstration work performed under this contract.

The contractor agrees that upon written application by DOE, it will grant to the Government for purposes of practicing [TBD] by or for the Government for the purpose of remediation or decontamination of chemically contaminated or radioactive sites, nonexclusive license(s) under any background patent on terms that are reasonable under the circumstances. If, however, the contractor believes that exclusive or partially exclusive rights are necessary to achieve expeditious commercial development or utilization, then a request may be made to the Director of Environmental and Waste Management or designee for approval of such licensing by the contractor. Notwithstanding the foregoing, the contractor shall not be obligated to license any background patent if the contractor demonstrates to the satisfaction of the Director of Environmental Restoration and Waste Management or designee that the contractor or its licensees are supplying the subject matter covered by said background patent in sufficient quantity and at reasonable prices to satisfy DOE needs, or have taken effective steps or within a reasonable time are expected to take effective steps to so supply the subject matter.

(c) Licensing Intellectual Property for Performing the Contract

The contractor also agrees and does hereby grant to the Government a royalty-free, non-exclusive license under any background patent or to any limited rights or restricted computer software for purposes of practicing a subject of this contract by or for the Government in research, development, or demonstration under this contract.

H.23 MULTIPLE AWARDS-PHASED ACQUISITIONS

A determination by the Contracting Officer to continue into subsequent phases will be restricted to only the current phase contractor(s). The determination to select contractor(s) for succeeding phases will be based on technical progress in the current phase, evaluation of the technical approach for activities planned for the upcoming phase application of program policy factors, and availability of funds.

The contractor shall prepare and submit a comprehensive report at least 60 days prior to completion of the current phase, which shall as a minimum, describe the actual and projected accomplishments in the current phase, including schedule and costs, and provide a detailed technical proposal, including schedule and costs for the upcoming phase. In the event the Government makes a determination to continue into subsequent phase(s), a bilateral contract modification will be issued in accordance with provision B.5, Decision Point (Phased SOW).

Following are the technical evaluation criteria and program policy factors which will be applied in determining progression into a subsequent phase(s):

A. Evaluation Criteria

EVALUATION CRITERION 1 --Understanding of Objectives and Applicability to DOE Needs (35%)

Proposals will be evaluated considering the offeror's understanding of the Department of Energy (DOE) Focus Area need(s) or problem(s) being addressed.

(1a) Soundness of the offeror's understanding of the overall project objectives, and of the issues, needs, and problems defined in the proposed research area; understanding, extent of knowledge, and completeness and accuracy of comparison of current technologies if available, with the proposed technology; understanding of potential advantages, benefits and improvements of the proposed technology over current, commercial, and emerging technologies; and, understanding of deficiencies of current technologies and feasibility of offeror's technology to overcome the deficiencies. Provide evidence that the research will yield results within a time frame consistent with implementation and deployment needs. Demonstrate an analysis that would include the site time frame for the need compared to the proposed time frame for the development to reach adequate maturity to fill the end user need. Provide evidence that the end user performance requirements have been addressed in the research and development activities to date and how they will be met when implemented in the field.

(1b) Applicability of the proposed technology to one or more DOE sites; and understanding of the site characteristics necessary or desirable for use of the proposed technology. Extent to which the results of the research to-date show a direct tie to end user needs and fills a gap in availability of needed technology or identify and quantify a potential benefit.

(1c) Extent of prior use, research, development or application of the proposed technology and appropriateness of how the prior work relates to the proposed application of the technology.

EVALUATION CRITERION 2 -- Technical Approach (35%)

(2a) Completeness and appropriateness of discussion regarding potential technical, regulatory, environmental, economic, production or other issues to be addressed by the technical approach;

soundness of scientific and engineering rationale; applicability of the proposed technology to the proposed research area; soundness and completeness of the Statement of Work (SOW) and technical approach for this phase; appropriateness and clarity of success criteria; and soundness and completeness of preliminary test plan. Identification of potential issues and proposed resolution of the issues for the development of the technology. Extent to which innovative aspects of the technology impacts the methods currently used in the field. Completeness of the description of the technology/process, major elements, and support equipment and system.

(2b) Reasonableness and appropriateness of schedule, milestones, proposed labor hours, labor categories, travel, consultants, and subcontractors.

(2c) Completeness and appropriateness of environmental information on the technical approach and project site(s); and significance of potential environmental, safety, and health impacts. Extent to which the research presents a solution that meets or exceeds current safety, health, and environmental protection levels and meets or reduces the risk to the public, workers, and the environment during operation in comparison to baseline and alternative technologies.

(2d) Degree to which technology provides benefits over baseline in terms of better, faster, cheaper, cleaner, etc. Extent of prior use, research, development or application of the proposed technology and appropriateness of how the prior work relates to the proposed technology.

(2e) Extent to which methodology and basic assumptions are used in comparing the technology with the baseline and/or alternative technologies.

EVALUATION CRITERION 3--Progress Towards Implementation (30%)

(3a) Clarity, conciseness and appropriateness of description of the current maturation stage of the project as defined in the document "**Tracking Technology Maturity in DOE's Environmental Management Science and Technology Program**", including a clear plan of progression through the next stage of development and how the proposed phase addresses that plan. Clarity and appropriateness of proposed path towards demonstration/ deployment including evidence such as letter(s) of commitment from necessary partners.

(3b) Reasonableness of commercialization plan and degree to which private sector partners have been identified and formal relationships established for commercialization of the technology.

(3c) Extent of commitment to take the technology through deployment following a successful demonstration.

B. Cost

The cost proposal will not be point scored, assigned a numerical weight or adjectivally rated. The costs proposed (including any phases) will be evaluated in accordance with the following criteria which are of equal weight:

- Reasonableness and appropriateness of cost.
- Evaluated probable cost to the Government.
- Extent of Cost Participation, if applicable

C. Program Policy Factors

These factors, while not indicators of the proposal's merit, e.g., technical excellence, cost, proposer's ability, etc., may be essential to the process of selecting the proposal(s) that, individually or collectively, will best achieve the program objectives. Such factors are often beyond the control of the offeror. Proposers should recognize that some very good proposals may not receive an award because they do not fit within a mix of projects which maximizes the probability of

achieving the DOE's overall research and development objectives. Therefore, the following Program Policy Factors may be used by the Source Selection Official to assist in determining which of the ranked proposal(s) shall receive DOE funding support.

- It may be desirable to select project(s) for award of less technical merit than other project(s) if such a selection will optimize use of available funds, and distribute funds and projects among a larger number of research areas.
- It may be desirable to select project(s) for award which initiate work at higher Gate levels and exhibit higher potential for expedient implementation.
- It may be desirable to select project(s) for award which will be applicable to multiple DOE sites.
- It may be desirable to select project(s) for award that represent a diversity of methods, approaches, or application of differing technology options.
- It may be desirable to select project(s) for award which minimize issues regarding siting, environmental permitting and the impact of regulatory issues.
- It may be desirable to select project(s) for award which represent a diversity of organizations (i.e., small businesses, educational institutions).
- It may be desirable to select project(s) for award which maximize the return on investment of previous Government funding.

The above factors will be independently considered by the Source Selection Official in determining the optimum mix of proposals that will be selected for support. These policy factors will provide the Source Selection Official with the capability of developing, from the competitive procurement, a broad involvement of organizations and organizational ideas, which both enhance the overall technology research effort and upgrade the program content to meet the goals of the DOE.

H.24 COMPREHENSIVE REPORT --PHASED ACQUISITIONS

A. General

The overall comprehensive proposal shall consist of three (3) physically separate volumes, individually entitled as stated below. The required number of each proposal volume is shown below:

Proposed Volume--Title	Original	Additional Copies Required	
	Copy #1 Paper Copy	Paper Copy	Electronic Copy
Volume 1 - Topical Report	1	5	1
Volume II - Technical Proposal	1	5	1
Volume III - Cost Proposal	1	5	N/A

B. Topical Report

The contractor shall submit a comprehensive report summarizing the actual accomplishments completed in the current phase, including schedules, milestones, and costs.

C. Technical Proposal

Volume II - Technical Proposal will be used to assess both the scientific merit of the proposed work and its relevance to DOE's current programmatic objectives. The technical proposal must be self-contained and written in a clear and concise manner. The proposal shall be definitive with respect to the research which the offeror actually proposes to conduct.

The maximum number of pages for the Technical Proposal shall be limited to 40 pages. To ensure that the technical proposal is evaluated strictly on its own merit, no cost information shall be included.

FORMAT AND CONTENT

The offeror shall include a technical discussion in the format specified below. This format relates to the technical evaluation criteria provided above. Alternate heading names and additional headings may be included as desired.

1. Cover Sheet. A completed and signed cover sheet (SF 33) as per FAR 52.215-1 shall be used. The title of the proposed effort should be concise and descriptive of the work to be performed.

2. Table of Contents. The offeror should address, at a minimum, the areas listed below. To help facilitate the review process and to ensure addressing all the review criteria, the offeror shall use the following Table of Contents when preparing the technical proposal.

≤ 40 pages

4. Technical Discussion. This section shall contain the major portion of the Technical Proposal. It shall clearly address each of the Technical Proposal evaluation criteria provided above and at a minimum cover the factors listed below.

A. UNDERSTANDING OF OBJECTIVES AND APPLICABILITY TO DOE NEEDS

The offeror shall provide a project objective (s), background and description of the innovative or improved technology, and its intended use(s) in DOE applications.

The offeror shall discuss their understanding of the specific Department of Energy (DOE) need(s) or problem(s) being addressed and the deficiencies of current technologies and feasibility of offeror's technology to overcome the deficiencies.

The offeror shall discuss the stage of development of the proposed technology or concept.

The offeror shall provide a clear description of the project objective(s) and expected performance of the equipment, device, or process and the potential benefits of the proposed innovative or improved technology in terms of anticipated performance and/or cost savings over potential baseline

technologies. Supporting performance data and cost advantages (in terms of percentages) information shall be provided to substantiate the claims of benefits.

The offeror shall discuss extent of prior use, research, development or application of the proposed technology and appropriateness of how the prior work relates to the proposed application of the technology.

The offeror shall provide a discussion of the applicability of the innovative/improved technology to address multiple needs at multiple DOE facilities, and the potential DOE complex-wide benefits of the innovative/improved technology relative to cost savings and safety benefits.

B. TECHNICAL APPROACH

The offeror shall discuss its proposed approach for research and development of the innovative or improved technology/concept including identification of relevant technical, regulatory, environmental, economic, production, or other significant issues.

The offeror shall provide a discussion of the potential technical issues and proposed resolution for the research and development of the proposed technology, concept or process.

The offeror shall discuss the preliminary test plan and other logistics of the proposed work as appropriate.

The offeror shall provide a table listing the estimated labor hours and labor categories (e.g., engineering, manufacturing, scientific, technician, analytical, clerical) required for the proposed work. It is not sufficient to merely indicate a certain number of hours; a determination as to why that number of hours is required. In addition, the hours shall be related to the specific tasks to be performed and, as far as possible, shall indicate the job disciplines and classifications (engineering, manufacturing, scientific) under each task. The offeror shall detail labor hours and labor categories for any proposed subcontracting or consulting effort for each task. It should also indicate the extent to which the offeror has previously worked with the proposed consultant or subcontractor. Again, no pricing information shall be included in the Technical Proposal. The offeror shall explain the purpose of the subcontract or consulting effort.

C. PROGRESS TOWARDS IMPLEMENTATION

The offeror shall provide a description of the current maturation stage of the project as defined in the document “Tracking Maturity in DOE’s Environmental Management Science and Technology Program” including a clear plan of progression through the next stage of development and how the proposed phase addresses that plan.

The offeror shall show support of relevant partners such as sites by providing evidence such as a letter of interest, indicating the extent of site involvement in the proposed activities.

The offeror shall provide a commercialization plan which clearly identifies private sector partners and their formal relationships for commercialization of the technology.

D. Cost Proposal

The cost proposal should be prepared using the “Guide for Preparation of Cost Proposals” found on NETL’s homepage at http://www.netl.doe.gov/business/forms/cost_rfp.html

NOTE: The contractor shall not proceed with Phase II activity without written Contracting Officer approval.

H.25 YEAR 2000 COMPLIANCE (APR 1998)

Year 2000 compliant means, with respect to information technology, the information technology accurately processes date/time data (including, but not limited to, calculating, comparing, and sequencing) from, into, and between the twentieth and twentyfirst centuries, and the years 1999 and 2000 and leap year calculations, to the extent that other information technology being acquired, properly exchanges date/time data with it.

The contractor assures, by acceptance of this award, that any items delivered under this contract are year 2000 compliant.

H.26 LOBBYING RESTRICTION (ENERGY & WATER DEVELOPMENT APPROPRIATIONS ACT, 2001) (DEC 1999)

The contractor agrees that none of the funds obligated on this award shall be expended, directly or indirectly, to influence congressional action on any legislation or appropriation matters pending before Congress, other than to communicate to Members of Congress as described in 18 U.S.C. 1913. This restriction is in addition to those prescribed elsewhere in statute and regulation.

A copy of the DOE "Lobbying Brochure" which provides a summary of the statutory and regulatory restrictions regarding lobbying activities for Federal contractors can be found at **(http://www.pr.doe.gov/lobbying.html)**

H.27 NOTICE REGARDING THE PURCHASE OF AMERICAN-MADE EQUIPMENT AND PRODUCTS -- SENSE OF CONGRESS (DEC 1999)

It is the sense of the Congress that, to the greatest extent practicable, all equipment and products purchased with funds made available under this award should be American made.

SECTION I - CONTRACT CLAUSES

I.1 52.252-2 CLAUSES INCORPORATED BY REFERENCE. (FEB 1998)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this/these address(es):

Federal Acquisition Regulations (Clauses starting with 52): http://www.arnet.gov/far/index.html
Department of Energy Regulations (Clauses starting with 952): http://www.pr.doe.gov/dear.html

I.2 52.203-8 CANCELLATION, RESCISSION, AND RECOVERY OF FUNDS FOR ILLEGAL OR IMPROPER ACTIVITY (JAN 1997)

I.3 52.202-1 DEFINITIONS. OCT 1995

I.5 52.203-3 GRATUITIES. APR 1984

I.6 52.203-5 COVENANT AGAINST CONTINGENT FEES. APR 1984

I.7 52.203-6 RESTRICTIONS ON SUBCONTRACTOR SALES TO THE GOVERNMENT. JUL 1995

I.8 52.203-7 ANTI-KICKBACK PROCEDURES. JUL 1995

I.9 52.203-8 CANCELLATION, RESCISSION, AND RECOVERY OF FUNDS FOR ILLEGAL OR IMPROPER ACTIVITY. (JAN 1997)

I.10 52.203-10 PRICE OR FEE ADJUSTMENT FOR ILLEGAL OR IMPROPER ACTIVITY. JAN 1997

I.11 52.203-12 LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS. JUN 1997

I.12 52.204-2 SECURITY REQUIREMENTS. AUG 1996

I.13 52.204-4 PRINTING OR COPYING DOUBLE-SIDED ON RECYCLED PAPER. AUG 2000

I.14 952.208-70 PRINTING. APR 1984

I.15 52.209-6 PROTECTING THE GOVERNMENTS INTEREST WHEN SUBCONTRACTING WITH CONTRACTORS DEBARRED, SUSPENDED, OR PROPOSED FOR DEBARMENT. JUL 1995

I.16 52.215-2 AUDIT AND RECORDS - NEGOTIATION. JUN 1999

I.17 52.215-2 AUDIT AND RECORDS - NEGOTIATION. (JUN 1999) -- ALTERNATE II APR 1998

I.18 52.215-8 ORDER OF PRECEDENCE--UNIFORM CONTRACT FORMAT. OCT 1997

I.19 52.215-10 PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA. (OCT 1997)

I.20 52.215-12 SUBCONTRACTOR COST OR PRICING DATA. OCT 1997

I.21 52.215-14 INTEGRITY OF UNIT PRICES. OCT 1997

I.22 52.215-15 PENSION ADJUSTMENTS AND ASSET REVERSIONS. (DEC 1998)

I.23 52.215-21 Requirements for Cost or Pricing Data or Information Other Than Cost or Pricing Data--Modifications. (OCT 1997) -- Alternate I (OCT 1997)

I.24 52.215-16 FACILITIES CAPITAL COST OF MONEY. OCT 1997

I.25 52.215-17 WAIVER OF FACILITIES CAPITAL COST OF MONEY. OCT 1997

I.26 52.215-18 REVERSION OR ADJUSTMENT OF PLANS FOR POSTRETIREMENT BENEFITS (PRB) OTHER THAN PENSIONS. (OCT 1997)

I.27 52.215-19 NOTIFICATION OF OWNERSHIP CHANGES. (OCT 1997)

I.28 52.216-7 ALLOWABLE COST AND PAYMENT. MAR 2000

I.29 952.216-7 ALLOWABLE COST AND PAYMENT.

I.30 52.216-8 FIXED FEE. (MAR 1997)

I.31 52.216-11 COST CONTRACT - NO FEE. APR 1984

I.32 52.219-4 NOTICE OF PRICE EVALUATION PREFERENCE FOR HUBZONE SMALL BUSINESS CONCERNS. (JAN 1999)

I.33 52.219-7 NOTICE OF PARTIAL SMALL BUSINESS SET-ASIDE. JUL 1996

I.34 52.219-8 UTILIZATION OF SMALL BUSINESS CONCERNS. OCT 2000

I.35 52.219-9 SMALL BUSINESS SUBCONTRACTING PLAN. OCT 2000

I.34 52.219-14 LIMITATIONS ON SUBCONTRACTING. (DEC 1996)

I.35 52.219-16 LIQUIDATED DAMAGES - SUBCONTRACTING PLAN. JAN 1999

I.36 52.219-23 NOTICE OF PRICE EVALUATION ADJUSTMENT FOR SMALL DISADVANTAGED BUSINESS CONCERNS. (OCT 1999)

I.37 52.222-1 NOTICE TO THE GOVERNMENT OF LABOR DISPUTES. FEB 1997

I.38 52.222-2 PAYMENT FOR OVERTIME PREMIUMS. (JUL 1990)

I.39 52.222-3 CONVICT LABOR. AUG 1996

I.40 52.222-4 CONTRACT WORK HOURS AND SAFETY STANDARDS ACT - OVERTIME COMPENSATION. JUL 1995

I.41 52.222-21 PROHIBITION OF SEGREGATED FACILITIES. FEB 1999

I.42 52.222-26 EQUAL OPPORTUNITY. FEB 1999

I.43 52.222-35 AFFIRMATIVE ACTION FOR DISABLED VETERANS AND VETERANS OF THE VIETNAM ERA. APR 1998

I.44 52.222-36 AFFIRMATIVE ACTION FOR WORKERS WITH DISABILITIES. JUN 1998

I.45 52.222-37 EMPLOYMENT REPORTS ON DISABLED VETERANS AND VETERANS OF THE VIETNAM ERA. JAN 1999

I.46 52.223-5 POLLUTION PREVENTION AND RIGHT-TO-KNOW INFORMATION. (APR 1998)

I.47 52.223-6 DRUG-FREE WORKPLACE. JAN 1997

I.48 52.223-14 TOXIC CHEMICAL RELEASE REPORTING. OCT 2000

I.49 952.224-70 PAPERWORK REDUCTION ACT. APR 1994

I.50 52.225-13 RESTRICTIONS ON CERTAIN FOREIGN PURCHASES. JUL 2000

I.51 952.226-74 DISPLACED EMPLOYEE HIRING PREFERENCE. JUN 1997

I.52 52.227-1 AUTHORIZATION AND CONSENT. (JUL 1995) -- ALTERNATE I APR 1984

I.53 52.227-2 NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT. AUG 1996

I.54 952.227-11 PATENT RIGHTS-RETENTION BY THE CONTRACTOR (SHORT FORM). FEB 1995

I.55 952.227-13 PATENT RIGHTS-ACQUISITION BY THE GOVERNMENT. SEP 1997

I.56 FAR 52.227-14 RIGHTS IN DATA - GENERAL. (JUN 1987) WITH ALTERNATE V (JUN 1987) AS AMENDED BY DEAR 927.409 JAN 1999

I.57 52.227-16 ADDITIONAL DATA REQUIREMENTS. JUN 1987

I.58 52.227-23 RIGHTS TO PROPOSAL DATA (TECHNICAL). (JUN 1987)

I.59 52.228-7 INSURANCE - LIABILITY TO THIRD PERSONS. MAR 1996

I.60 52.230-2 COST ACCOUNTING STANDARDS. APR 1998

I. 61 52.230-3 DISCLOSURE AND CONSISTENCY OF COST ACCOUNTING PRACTICES. (APR 1998)

I.62 52.230-5 COST ACCOUNTING STANDARDS - EDUCATIONAL INSTITUTION. APR 1998

I.63 52.230-6 ADMINISTRATION OF COST ACCOUNTING STANDARDS. NOV 1999

I.64 52.232-17 INTEREST. JUN 1996

I.65 52.232-20 LIMITATION OF COST. APR 1984

I.66 52.232-25 PROMPT PAYMENT. (JUN 1997)

I.70 52.232-22 LIMITATION OF FUNDS. APR 1984

I.71 52.232-23 ASSIGNMENT OF CLAIMS. JAN 1986

I.72 52.232-33 PAYMENT BY ELECTRONIC FUNDS TRANSFER -- CENTRAL CONTRACTOR REGISTRATION. MAY 1999

I.73 52.233-1 DISPUTES. (OCT 1995) -- ALTERNATE I DEC 1991

I.74 52.233-3 PROTEST AFTER AWARD. (AUG 1996) -- ALTERNATE I JUN 1985

I.75 952.235-70 KEY PERSONNEL. APR 1994

I.76 52.237-2 PROTECTION OF GOVERNMENT BUILDINGS, EQUIPMENT, AND VEGETATION. APR 1984

I.77 52.242-1 NOTICE OF INTENT TO DISALLOW COSTS. APR 1984

I.78 52.242-3 PENALTIES FOR UNALLOWABLE COSTS. OCT 1995

I.79 52.242-4 CERTIFICATION OF FINAL INDIRECT COSTS. JAN 1997

I.80 52.242-13 BANKRUPTCY. JUL 1995

I.81 52.243-2 CHANGES - COST-REIMBURSEMENT. (AUG 1987) -- ALTERNATE V APR 1984

I.82 52.244-5 COMPETITION IN SUBCONTRACTING. DEC 1996

I.83 52.244-6 SUBCONTRACTS FOR COMMERCIAL ITEMS AND COMMERCIAL COMPONENTS. OCT 1998

I.84 52.245-5 GOVERNMENT PROPERTY (COST-REIMBURSEMENT, TIME-AND-MATERIAL, OR LABOR-HOUR CONTRACTS). (JAN 1986)

I.85 52.245-5 GOVERNMENT PROPERTY (COST-REIMBURSEMENT, TIME-AND-MATERIAL, OR LABOR-HOUR CONTRACTS). (JAN 1986) -- ALTERNATE I JUL 1985

I.86 952.245-5 GOVERNMENT PROPERTY COST REIMBURSEMENT, TIME-AND-MATERIALS, OR LABOR-HOUR CONTRACTS.

I.87 52.246-25 LIMITATION OF LIABILITY--SERVICES. FEB 1997

I.88 952.247-70 FOREIGN TRAVEL MARCH 2000

I.89 52.249-5 TERMINATION FOR CONVENIENCE OF THE GOVERNMENT (EDUCATIONAL AND OTHER NONPROFIT INSTITUTIONS). SEP 1996

I.90 52.249-6 TERMINATION (COST-REIMBURSEMENT). SEP 1996

I.91 52.249-14 EXCUSABLE DELAYS. APR 1984

I.92 52.253-1 COMPUTER GENERATED FORMS. JAN 1991

SECTION J - LIST OF ATTACHMENTS

J.1 LIST OF ATTACHMENTS (MAR 1999)

J.2 PART III, SECTION J, ATTACHMENT A -- STATEMENT OF WORK / PROGRAM OBJECTIVES (MAR 1999)

Program Objectives
Environmental Management Applied Research and Development
PRDA DE-RA26-01NT41013

A. PRDA Objective

The objective of the procurement is to conduct applied research, development and demonstration of innovative and improved technologies to address selected technology needs of the focus areas in the Office of Science and Technology (OST) within the DOE's Office of Environmental Management (EM).

B. Background Information

The following sections are intended to provide background information pertinent to the entire Program Research and Development Announcement (PRDA).

NOTE: Attachment references within Section J.2 are attachments to the report "Tracking Technology Maturity in DOE's Environmental Management Science and Technology Program," which can be viewed at NETL homepage (http://www.fetc.doe.gov/business/solicit/index.html).

1. Focus Areas

The OST focus area concept was introduced in 1994. The primary role of focus areas is to provide responsive, technically-defensible solutions for cleanup and environmental stewardship at DOE sites. Each of the five focus areas concentrates on providing technical solutions to one of the EM's major problem. The five focus areas are the Tanks Focus Area (TFA), Transuranic and Mixed Waste Focus Area (TMFA), Deactivation and Decommissioning Focus Area (DDFA), Subsurface Contaminants Focus Area (SCFA), and Nuclear Materials Focus Areas (NMFA). These five focus areas are responsible for implementing the mission and strategy of the OST organization.

The focus areas receive technology need and problem statements from Site Technology Coordinating Groups (STCG) at the DOE sites. The main responsibility of the STCGs is to represent the technology end users, problem holders and decisionmakers at the DOE sites. The focus areas respond to the STCG technology needs with recommended existing technical solutions, research and development projects, or basic science projects. This PRDA represents an approach to meet Fiscal Year 2000 unmet needs from the focus areas. The intent of the PRDA is to award contracts to develop technological solutions to meet selected unmet needs from FY2000.

More information on focus areas can be found at the OST website, http://ost.em.doe.gov.

NOTE: Stage 1 efforts are not being considered under this solicitation.

2. Stage-Gate Technology Model

OST has adopted a stage-gate technology model which defines the maturity of technology from basic science to deployment and describes key criteria that must be met for a technology to pass through a gate from a lower maturity stage to the next higher maturity stage. The stage-gate technology model is described fully "Tracking Technology Maturity in DOE's Environmental Management Science and Technology Program."

With one exception, offerors submitting proposals to meet the needs of the NMFA, TFA, TMFA, DDFA, and SCFA in this PRDA are expected to start technology development at one of the following stages.

Stage 2 - Applied Research
Stage 3 - Exploratory Development

The exception is that offerors submitting proposals to meet the SCFA need for real-time downhole tritium monitors (Section D 4.1.1 and 4.2.1) must start technology development at one of the following stages.

Stage 3 - Exploratory Development
Stage 4 - Advanced Development
Stage 5 - Engineering Development
Stage 6 - Demonstration

While technology development must generally begin at Stages 2 or 3 for this PRDA, it is the intent of this PRDA to continue successful projects and technologies through Stage 6 which is technology demonstration. Therefore, offerors are requested to include optional phases through Stage 6 for technology demonstration. Generally, each discrete stage after the starting stage of technology development should be associated with an optional phase.

Prospective offerors are advised that the OST Decision Process described in "Implementation Guidance for the Technical Peer Review Process." is used to evaluate the progress of selected projects and to assist in decisions regarding continuation of projects to subsequent phases. As part of the OST Decision Process, OST uses the standards of the American Society of Mechanical Engineers for independent technical peer reviews. The Institute for Regulatory Science implements the ASME technical peer reviews on behalf of OST. ASME peer reviews are required at Gates 2 and 5.

Prospective offerors are also encouraged to review the results and progress of basic science projects (i.e., Stage 1) funded by the Environmental Management Science Program and consider whether any warrant continued development work in Applied Research, Stage 2 or subsequent stages. Information on all EMSP projects can be located at **http://emsp.em.doe.gov.**

3. Technology Needs

Technology needs relevant to this PRDA are listed by each of the focus areas in their respective sections on needs and problem statements. More details concerning these needs can be found at OST's Needs Management System (NMS) at **http://em-needs.em.doe.gov/entry.asp**, the individual STCG websites which are linked from http://ost.em.doe.gov/Stcg.htm, or by contacting the appropriate Focus Area Topic Point of Contact listed in Section C.

4. PRDA Website References

National Energy Technology Laboratory (NETL): http://www.netl.doe.gov
NETL Business Opportunities: http://www.netl.doe.gov/business/solicit/index.html
Environmental Management: http://www.em.doe.gov
EM OST: http://ost.em.doe.gov
NMS Database: http://em-needs.em.doe.gov/entry.asp.
STCG Links: http://ost.em.doe.gov/Stcg.htm
EMSP Project Information: http://emsp.em.doe.gov
TFA Homepage: http://www.pnl.gov/tfa
TMFA Homepage: http://wastenot.inel.gov/mwfa
DDFA Homepage: http//www.netl.doe.gov/dd/
SCFA Homepage: http://www.envnet.org/scfa
NMFA Homepage: http://id.inel.gov/nmfa

C. Statement of Research Needs:

Within each technical area there are key needs for which proposals are sought. A description and the functional performance requirements of the key needs are provided as follows:

1. **Tanks Focus Area:**

1.1.1 Tanks Focus Area Topic: Higher Capacity Ion Exchange Materials

1.1.2 Background: One of the legacies of the nuclear era is the nearly 100 million gallons of waste currently stored in tanks at DOE sites at Hanford, Savannah River, and the INEEL. These wastes are contaminated with radioactive elements such as cesium (Cs), strontium (Sr), technetium (Tc), and the transuranic elements (TRU). One way to protect citizens and the environment from exposure to the radioactive hazardous wastes is to immobilize the waste in an impervious form such as a glass. However, due to the enormous volume of waste, the glass volume would greatly exceed repository space for high-level waste (HLW) and be prohibitively expensive. To reduce the volume of highly radioactive waste that must be stored in a HLW repository, the radioactive elements can be separated from the bulk of the material, which can then be stored as low-level radioactive waste (LLW) at available sites around the country. LLW disposal is much less costly.

Ion exchange processes have been developed for the separation of several radioactive components including Cs, Sr, TRU, Tc, etc. The cost of these operations can be strongly affected by the size of the equipment required, and this is affected by the concentration at which the target radionuclides can be loaded on the resin and on the rate at which the loading occurs (the length of "loading front"). Both the total capacity of the resin and the selectivity of the resin for the target radionuclide determine the maximum loading of the resin.

For high-level radioactive tank wastes, the radionuclides are in complex and concentrated solutions (highly alkaline at Hanford and SRS, and highly acid at INEEL) with a wide range of cations. The need for high selectivity cannot be ignored in estimating the resin loading capacity. The solutions also contain high concentrations of nitrate ions.

1.1.3 Objectives/Needs: The objective of this research is to develop "new" materials that have not been previously tested significantly for separation of ions from DOE tank waste. The new "resins/sorbents" can be inorganic or organic materials that remove any one (or more) of the radionuclides listed above in the Background. A partial list of existing ion exchange materials and other materials that have received significant testing are described in reports on the TFA web site: **http://www.pnl.gov/tfa/back/catgyref.stm - pretreatment**. These reports also provide information on the performance of those materials.

The proposer should note that effective loading depends upon the solution composition; so optimal resins could be different for alkaline and acid solutions. Both regenerable and non-regenerable resins can be considered. For regenerable resins, it will be necessary that the regeneration agents contain no component that would present problems with formation of high-quality glass (where the radionuclides l will eventually be immobilized) or require any significant increase in the amount of glass produced. For non-regenerable resins, it may be necessary to send the entire loaded resin to be vitrified into high-level waste glass. In that case, it will be necessary that the resin contain no material that interferes with operation of the melter or adds unacceptably to the volume of high-level waste produced.

The research program must demonstrate that high loading and high loading rates can be achieved from realistic solutions that simulate actual tank waste. Separations from simple single salt solutions or even from simple acid or alkaline solutions of the target radionuclides may be used in experiments but are not sufficient to demonstrate feasibility of the technology.

Some additional requirements for an acceptable ion exchange material are listed below. This list may not be completely comprehensive and it is expected that proposers knowledgeable in this field will identify additional functional requirements in their proposal and identify how their technology will meet those additional requirements, as well as those listed below. The ion exchange material shall:

- be compatible with the tank waste
- be stable in alkaline or acid wastes (separate ion exchange materials can be proposed for the acid and alkaline wastes)
- must extract targeted contaminants so that the extracted (bulk) fraction can be classified as a low level waste product for disposal purposes
- be sufficiently stable in the presence of high radiation fields to be used for extended periods
- be compatible with other processing steps in the waste treatment flow sheet
- not add any material to the processed liquid stream that would interfere with its incorporation into stable "Saltstone" (concrete) for low-level waste disposal

In addition, the concentrated radioactive ion product(s) must not contain significant quantities of any material that would interfere with the formation of a stable borosilicate glass from the high-level waste or result in any significant increase in the volume of high-level waste glass formed. (Discussions of the compatibility of different elements in borosilicate glass are given in: http://www.pnl.gov/tfa/back/catgyref.stm#Immobil.)

1.1.4 Associated STCG Needs: RL-WT082, ID-2.1.06, ID-2.1.28, SR00-2034

1.1.5 EMSP Related Research: 54735, 60345

1.1.6 Point of Contact:

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1.1.7 Special Requirements: Proposals for phased development efforts are solicited. Proposals with shorter development periods will be viewed favorably. Initial awards will fund development efforts through the initial development phase or through September 2002 whichever is first. Funding for additional phases will be provided based upon continuing need for the technology, available budget, and performance reviews.

1.2.1 Tanks Focus Area Topic: Characterization of Tank Solids and Immobilized Waste Forms Without Dissolution

1.2.2 Background: The DOE's EM program must safely process millions of gallons of highly radioactive waste currently held in underground storage tanks at several sites across the country. This waste consists of liquids with dissolved solids, suspended solids, and more consolidated solids (e.g. crusts, tank heels). Proper design, operation, and control of treatment processes for this waste require an accurate knowledge of the individual constituents of the waste, especially radionuclides and chemically toxic compounds. Characterization of waste solids is especially important to control the content of material used as feed for the waste treatment process and to monitor the content of subsequent solid products and immobilized waste forms. In addition, characterization of soils and other solids that may have been contaminated with high level waste will also be required as part of EM clean up activities.

The baseline method for the characterization of high-level waste solids is the complete dissolution of the solids via chemical treatments. The dissolution procedures must be done in hot cells with remote

manipulators because of the high activity levels of the waste. As a consequence, the baseline methodology is time consuming, labor intensive, and generates significant amounts of secondary waste. (It should also be noted, that some high-level waste solids are not soluble even in highly aggressive acidic media-i.e., boiling nitric and hydrofluoric acid mixtures- and that these solids cannot be analyzed via the baseline method.) After dissolution, elemental analysis for radionuclides and RCRA metals is done using ICP mass spectrometry, or analysis of RCRA metals is done via atomic emission spectrometry. Total turn around time for assays is a minimum of two weeks and can be considerably longer.

The alternative to the baseline method most explored to date for application to highly radioactive solid waste samples has been the methodology of Laser Ablation /Inductively Coupled Plasma/Mass Spectrometry (LA/ICP/MS). An instrument of this type has been installed for hot cell analyses in the Hanford 222S Production Laboratory. Development to date has shown that the instrument is valuable to qualitatively identify the elements and some radioisotopes in solid tank waste samples. However, the validity of quantitative analyses with adequate accuracy and precision comparable to a baseline method (i.e., acid dissolution and aspiration into ICP/MS) has not been demonstrated.

The laser ablation (LA/ICP/MS) methodology has been subject to a good deal of fundamental scientific development in the academic and government research communities. Scientific development is also underway for other approaches to direct elemental analysis of solids; and it is recognized that other approaches such as laser induced breakdown spectroscopy, x-ray fluorescence, or others may be appropriate to replace the baseline technology.

1.2.3 Objectives/Needs: The objective of this applied research is to develop a rapid analytical tool to quantitatively analyze highly radioactive tank waste solids and immobilized tank waste forms without dissolving the sample. The applied research project shall:

- demonstrate that the proposed method will give level of detection (LOD), accuracy and precision for elemental analysis comparable to the baseline methods
- demonstrate that the method can produce analytical results from heterogeneous solids, similar to retrieved tank waste, that are comparable to the baseline dissolution methods (giving bulk average compositions)
- demonstrate satisfactory quantification for all elements of concern. For the Hanford Site, approximately 80 primarily inorganic analytes, including specific radionuclides, have been identified for analyses. See Reference 1 for detailed analytes and levels of concern
- develop an analysis method with turn around time considerably better than baseline and reduced generation of secondary waste
- develop user friendly operating procedures and data reduction routines
- develop user acceptance
- address issues of certification by the EPA or other regulatory authority for DOE application.

Proposals that address analysis of waste glass product are also desirable. However, it is considered insufficient to develop an analytical technique that is only applicable to homogeneous solids. Development of a system applicable toward heterogeneous solids is necessary.

The proposal should include proof of principle data and information that the proposed method has a likelihood of success to provide quantitative results at least as good as the baseline technology and provide significant savings in sample preparation and cost of analysis.

1.2.4 Associated STCG Needs: SR00-2054S, SR00-2044, OR-151, ID-2.1.52, ID-2.1.56, RL-WT031S, RL-WT-09

1.2.5 EMSP Related Research: 54674, 55318, 60075, 60217

1.2.6 Point of Contact:

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1.2.7 Special Requirements: Proposals containing partnerships of researchers with complementary capabilities and synergistic execution of development tasks are desirable.

Proposals for development efforts of 1-2 years are solicited herein. Proposals with shorter development periods will be viewed favorably. Initial awards will fund work through September 2002. Funding for the additional phases(s) will be provided based upon continued technical need for the technology, available budget, and performance review.

Vitrification of high-level waste is already underway at two DOE sites (Savannah River and West Valley Demonstration Project). Extensive planning of waste treatment processes is ongoing at the Hanford Site. Improved waste solids characterization methodology could be applied immediately. This need for improvement in solids characterization will intensify as the pace of waste processing increases over the next 5 years. Hot validation and user acceptance of a method for improved solids characterization technology is expected to continue immediately following successful completion of the second year of this applied research project. Follow-on proposals including "hot" demonstration work will be considered based upon available funding and satisfactory performance of this applied research project. Such proposals will require partnership with the site user.

1.3.1 Tanks Focus Area Topic: Waste Tank Leak Plugging and Repair

1.3.2 Background: Weapons, space, medical, and research programs led by the U.S. government have created a legacy of nuclear waste. This waste is a result of the nation's efforts to create and handle waste from nuclear weapons, test reactors, space reactors (for National Aeronautics and Space Administration), naval reactors, and other programs. The U.S. Department of Energy (DOE), established in 1977, has inherited this legacy waste. Part of this legacy includes 149 underground storage tanks at the Hanford Site that contain millions of gallons of highly radioactive liquid waste. These cylindrical vessels, built between 1943 and 1964, have a single carbon steel liner surrounded by reinforced concrete separated by a thin layer of asphalt. The domes of these tanks are made of concrete without an inner covering of steel. The tanks were constructed in two general types; smaller tanks with a 20 ft. diameter and 55,000 gal. capacity, and large tanks with a 75 ft. diameter and varying height for capacities of 500,000 to 1,000,000 gallons. The caustic (pH ~12) waste in these tanks is classified as high-level waste, transuranic waste, and mixed waste. A cutaway sketch of a typical tank configuration can be seen at, http://www.pnl.gov/tfa/sites/hanford/singlece.stm.

All the single-shell tanks are below grade with at least 6 feet of soil cover for radiation protection. Risers penetrating the tank domes provide access to the tanks. Existing risers vary in diameter from 4 inches to 42 inches. Fifty-seven of the tanks contain pipes used as liquid observation wells to measure waste levels in the tanks using neutron probes, manual tapes, and other techniques. Sixty-four of the 75-ft diameter tanks do not have a 42-inch central riser for access. Thirty-nine of the 75-ft diameter tanks have four or five centrally located 42-inch risers. Although new risers can be added to the single-shell tanks, this is a very costly proposition.

All 149 single-shell tanks have exceeded their design life by 20 to 40 years and they continue to deteriorate with time. Stress corrosion cracking has been determined the primary mode of single-shell tank failure. The configuration of single-shell tanks and the wastes they contain make it difficult to conduct tank integrity testing in support of tank failure analyses.

Sixty-seven of Hanford's 149 single-shell tanks are confirmed or suspected "leakers." Consequently, there is a **"bias for action"** to minimize the potential for tank leakage to the environment. This "bias for action" is being accomplished through interim stabilization of the single-shell tanks by removing pumpable liquids, followed by the ultimate retrieval and processing of remaining solid wastes. The current practice for retrieval of the solid tank wastes is to sluice the tanks with water and pump out the dissolved or suspended solids. This method leads to concerns about adding liquid to tanks known to leak or of questionable integrity. Leakage from the tanks during retrieval would release radioactive and hazardous contaminants into the vadose zone, ultimately reaching the groundwater.

1.3.3 Objectives/Needs: The objective of this research is to develop a mitigation tool to prevent or greatly retard the escape of radioactive and hazardous contaminants to the vadose zone and groundwater during waste retrieval operations from leaking tanks. The method may be applied before retrieval efforts in tanks with known leaks. The ideal solution would enable rapid deployment so that, after a leak was detected, retrieval operations could be continued without major delays or redeployment of retrieval equipment.

A tank leak(s) can only be located within an approximate 20 ft segment of the tank. Therefore, the leak mitigation tool must be effective on the leak when the mitigation method(s) is remotely applied over a large general area. Some additional requirements for an acceptable mitigation tool are listed below. This list may not be completely comprehensive and it is expected that those skilled in the art will identify additional functional requirements in their proposal and identify how their technology will meet those additional requirements, as well as those listed below. The mitigation method(s) shall:

- be deployable remotely w/o extensive excavation of soils around the tank
- be deployable in a high radiation field
- provide for rapid sealing (of a leak) that would endure throughout the retrieval period (up to a year)
- be effective over a wide range of leakage flow rates
- be useable on tanks with fluctuating waste levels, temperatures, and pH
- be acceptable to the environmental surroundings outside the tank
- be compatible with subsequent waste retrieval and waste processing steps

Both in-tank and ex-tank solutions are solicited. Multiple solutions are desirable.

Examples of possible approaches could be, but are not limited to the following:

- a material that, when applied in the surrounding soil (sand, gravel, cobble), would form a water tight plug where the material penetrated the leak site (tank wall or concrete shell) and initiate a reaction (initiated by chemistry or radioactivity);
- a material that could be applied to the exterior surface of the concrete, creating an impermeable layer;
- a material that could be applied to the interior surface of the tank by mechanical means (e.g., spray or mechanical pressing), effectively "sealing" a leak site; and
- a material that, when added in small amounts to the tank contents (high ionic strength water and radioactive waste), would react with the outside soil (sand or concrete) when the water containing the material penetrated the tank.

1.3.4 Associated STCG Needs: RL-WT-027, SR00-2035, SR00-2028

1.3.5 EMSP Related Research: None on current list

1.3.6 Point of Contact:

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1.3.7 Special Requirements: Proposals for development efforts of 2-3 years are solicited. Initial awards will fund work through Sept. 2002. It is anticipated that two or more phases may be appropriate for this development effort. The first phase might include identifying candidate approaches; refining the approaches; defining evaluation criteria for performance, application, storage, safety, etc.; preparing and demonstrating, at laboratory scale, application methodology and performance of selected alternatives; and preparing, based on the results of the preliminary research, a developmental plan for moving to full-scale demonstration in a cold environment. Follow on phase(s) would be full-scale testing in a non-radioactive environment and materials testing (if appropriate) in a radioactive environment. Funding for the out year tasks will be provided based upon available budget and performance review.

2. **Transuranic and Mixed Waste Focus Area**:

2.1.1 Transuranic and Mixed Waste Focus Area Topic: Concepts for Characterization of Radionuclides in Remote Handled Waste Containers

2.1.2 Background: Various regulatory drivers and stakeholder expectations for transuranic mixed waste in remote handled waste containers (payload container has radiation dose rate of greater than 200 millirem per hour and less than 1,000 rem per hour at the surface) require the detailed characterization of the radioactive components.

"Acceptable Knowledge" is defined by the Waste Analysis Plan, "Waste Isolation Pilot Plant Hazardous Waste Facility Permit", as a number of techniques used to characterize transuranic mixed waste, such as process knowledge, records of analysis acquired prior to the Resource Conservation and Recovery Act, and other supplemental sampling and analysis data.

"Process Knowledge" is a subset of "Acceptable Knowledge," and is defined as documentation or records providing information about various attributes of waste streams, such the chemical, physical, and radiological properties. The documentation used for "Process Knowledge" may either be: (a) generated under a current site procedure that is subject to the site quality assurance program requiring the preparation and submittal of the documentation of a quality assurance record, or (b) previously generated and, as such, also requires evaluation for consistency with the site quality assurance program and formal submittal to site project records as a quality assurance record.

In the absence of "Process Knowledge," there is currently no standard nondestructive method for identifying and quantifying the radionuclide content in waste drums that are remotely handled (for example, using robotic systems).

2.1.3 Objectives/Needs: The objective of this research is to obtain the basic signature information for the fissile isotopes. The radionuclide isotopes of interest include Americium-241; Plutonium-238, 239, 240, 242; uranium-233, 234, 238; Cesium-137; and Strontium-90 must be reported in the Waste Isolation Pilot Plant Waste Information System.

If these ten isotopes do not comprise 95 percent of the waste composition, there are also other radioisotopes of interest: (a) Elements with atomic number greater than 92, (b) Alpha emitting radionuclides with half lives greater than 20 years, (c) Relatively large quantity of beta emitting radionuclides with half lives typically 30 years or less, and (d) Relatively large quantity of gamma emitting radionuclides with half lives typically 30 years or less.

Some additional targets for acceptable nondestructive assay concepts are listed below. This list may not be completely comprehensive, and it is expected that Proposers knowledgeable in this field will identify additional performance, functional, and technical requirements, and identify how their concept will meet those additional requirements, as well as those listed below. The assay concept shall be:

- Able to perform in a high radiation environment (external dose greater than 0.2 rem (200 milli-rem) per hour and less than or equal to 1,000 rem per hour.
- Able to measure individual isotopes and quantities.

2.1.4 Associated STCG Needs: AL-09-01-24-MW-S, CAO-99-04, ID-3.1.32, ID-3.1.46, ID-S.1.05, RL-MW-013 (The listed STCG Numbers and Titles may be misleading. Many of these needs request activities in applied research, development, and demonstration in the same need. The needs are provided to provide background information and to generate ideas.

2.1.5 EMSP Related Research: 54751 (The listed EMSP project is not relevant to what Focus Area wants. The project is provided as background information and to generate ideas.)

2.1.6 Point of Contact:

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2.1.7 Special Requirements: Proposals for phased applied research and development efforts of two to three years are solicited. Proposals with shorter applied research and development periods will be viewed favorably. Initial awards will fund development efforts through the initial development phase or through September 2002 whichever is first. Funding for the follow-on phases will be provided based upon the continuing need for the technology, the available budget, and the project performance and peer reviews.

2.2.1 Transuranic and Mixed Waste Focus Area Topic: Concepts for Characterization of Remote Conservation and Recovery Act Materials (metals and organics) in Remote Handled Waste Containers.

2.2.2 Background: Stringent Waste Isolation Pilot Plant acceptance criteria for transuranic mixed waste require the detailed characterization of the hazardous components. Currently, there are no standard nondestructive methods for identifying and quantifying the Resource Conservation and Recovery Act material content (metals and organics) in waste drums that are remotely handled (for example, using robotics systems).

2.2.3 Objectives/Needs: The objective of this research is to develop concepts for the nondestructive assay (identification and quantification) of Resource Conservation and Recovery Act material content in these drums. The materials of immediate interest include arsenic, beryllium, lead, mercury, selenium, and silver. Other items of interest are contained in the following table.

HAZARDOUS WASTE	ENVIRONMENT PROTECTION AGENCY HAZARDOUS WASTE CODE	NOTE
Acetone	F003	Spent non-halogenated solvent
Arsenic	D004	
Barium	D005	
Benzene	D018	
Beryllium powder	P015	
Cadmium	D006	
Carbon tetrachloride	D019	
Carbon tetrachloride	F001	Spent halogenated solvent
Chlorobenzene	D021	
Chloroform	D022	
Chromium	D007	
Chromium	F006	Wastewater treatment sludges form electroplating operations
Cresol	D026	
1,4 – Dichlorobenzene	D027	
1,2 – Dichloroethane	D028	
1,1 – Dichloroethylene	D029	
2,4 – Dinitrotoluene	D030	
Ethyl Acetate	F003	Spent non-halogenated solvent
Ethyl Benzene	F003	Spent non-halogenated solvent
Ethyl Ether	F003	Spent non-halogenated solvent
Hexacholorobenzene	D032	
Hexachloroethane	D034	
Lead	D008	
Mercury	D009	
Methyl Ethyl Ketone	D035	
Nitrobenzene	D036 F004	Spent non-halogenated solvent
Pentachlorophenol	D037	
Pyridine	D038	
Selenium	D010	
Silver	D011	
Tetrachloroethylene	D039 F002	Spent halogenated solvent
Trichloroethylene	D040	
Toluene	F005	Spent non-halogenated solvent
Vinyl chloride	D043	
Xylene	F003	Spent non-halogenated solvent

Some additional targets for acceptable nondestructive assay concepts are listed below. This list may not be completely comprehensive, and it is expected that Proposers knowledgeable in this field will identify additional performance, functional, and technical requirements, and identify how their concept will meet those additional requirements, as well as those listed below. The assay concept shall:

- Be able to perform in a high radiation environment (greater than 200 millirem per hour contact).
- Be nondestructive to both sample and waste container.

- Generate data in real time (less than 15 minutes).
- Be readily employed in a glove box environment. Sample size is a 55-gallon drum.
- Meet all the Waste Isolation Pilot Plant Quality Assurance Program Plan requirements. See **http://www.wipp.carlsbad.nm.us/library/qapd/caoqupd.pdf**
- Meet all the Environmental Protection Agency SW-846 requirements. See http://www.epa.gov

2.2.4 Associated STCG Needs: ID-3.1.58, ID-3.1.59 The listed STCG Numbers and Titles may be misleading. Many of these needs request activities in applied research, development, and demonstration in the same need. The needs are provided as background information and to generate ideas.

2.2.5 EMSP Related Research: 59991, 60231 (The listed EMSP projects are not relevant to what Focus Area wants. The projects are provided to provide background information and to generate ideas.)

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2.2.7 Special Requirements: Proposals for phased applied research and development efforts of two to three years are solicited. Proposals with shorter applied research and development periods will be viewed favorably. Initial awards will fund development efforts through the initial development phase or through September 2002 whichever is first. Funding for the follow-on phases will be provided based upon the continuing need for the technology, the available budget, and the project performance and peer reviews.

2.3.1 Transuranic and Mixed Waste Focus Area Topic: Understanding the Generation Mechanisms of Dioxins and Furans in Non-Thermal Treatment Facilities

2.3.2 Background: Many currently available non-thermal (alternatives to incineration) treatment facilities generate dioxins and furans. There is little understanding of the generation and control mechanisms for dioxins and furans in the off gas systems from the facilities. The dioxins and furans of major interest include:

- 2378 Tetrachlorodibenzodioxin
- 12378 Pentachlorodibenzodioxin
- 123478 Hexachlorodibenzodioxin
- 123678 Hexachlorodibenzodioxin
- 2378 Tretrachlorodibenzofuran

2.3.3 Objectives/Needs: The objective of the research is to develop an understanding of the dioxin and furan formation mechanisms in non-thermal treatment facility off gas systems. The understanding starts with data from an operating non-thermal treatment facility off gas system and uses the current understanding from the off gas systems of thermal facilities:

- Dioxin remains after combustion because of flame bypass, low temperature operation, poor mixing, particulate burnout, and improper quenching.
- In 500 to 700 degree centigrade range, dioxins form on soot in gas phase (form based on complex organic structure and chlorine donor).
- In 500-degree centigrade range, dioxins form on fly ash particles.

Some additional targets for acceptable understanding are listed below. This list may not be completely comprehensive, and it is expected that Proposers knowledgeable in this field will identify additional

performance, functional, and technical requirements, and identify how their understanding will meet those additional requirements, as well as those listed below. The understanding shall:

- Explain if undestroyed dioxins remain.
- Explain if gas phase formation occurs.
- Explain if solid phase particle formation occurs.

2.3.4 Associated STCG Needs: SR-00-1004, SR-00-1021 The listed STCG Numbers and Titles may be misleading. Many of these needs request activities in applied research, development, and demonstration in the same need. The needs are provided as background information and to generate ideas.

2.3.5 EMSP Related Research: None on current list

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2.3.7 Special Requirements: Proposals for phased applied research and development efforts of two to three years are solicited. Proposals with shorter applied research and development periods will be viewed favorably. Initial awards will fund development efforts through the initial development phase or through September 2002 whichever is first. Funding for the follow-on phases will be provided based upon the continuing need for the technology, the available budget, and the project performance and peer reviews.

2.4.1 Transuranic and Mixed Waste Focus Area Topic: Concepts for Separation and Extraction (alternatives to incineration) of Plutonium in Transuranic Mixed Waste

2.4.2 Background: High activity, plutonium-238 contaminated transuranic mixed waste is stored within the Department of Energy complex. These waste streams may not be shippable to the Waste Isolation Pilot Plant due to the excessive generation of hydrogen gas resulting from radiolysis of organic constituents. In addition, there are no standard processes for the separation and extraction of plutonium from solid waste. Oxidation processes, reduction processes, and incineration processes have limited application to these waste streams.

2.4.3 Objectives/Needs: The objective of this research is to evaluate separation and extraction processes that do not meet the requirements for the Alternatives to Incineration Solicitation. See http://www.netl.doe.gov. Process concepts are sought to separate and extract the sub-micron size plutonium-238 in the waste streams.

Some additional targets for acceptable separation and extraction concepts are listed below. This list may not be completely comprehensive, and it is expected that Proposers knowledgeable in this field will identify additional performance, functional, and technical requirements, and identify how their concept will meet those additional requirements, as well as those listed below. The separation and extraction concept shall:

- Use of chemicals that require little special handling.
- Contain of the submicron size plutonium.
- Minimize waste generated by the concept itself.
- Identify a suitable disposal path for any waste stream generated.

2.4.4 Associated STCG Needs: AL-09-01-09-MW, SR-00-1007 The listed STCG Numbers and Titles may be misleading. Many of these needs request activities in applied research, development, and demonstration in the same need. The needs are provided as background information and to generate ideas.

2.4.5 EMSP Related Research: 64979 (The listed EMSP project is not relevant to what Focus Area wants. The project is provided as background information and to generate ideas.)

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2.4.7 Special Requirements: Proposals for phased applied research and development efforts of two to three years are solicited. Proposals with shorter applied research and development periods will be viewed favorably. Initial awards will fund development efforts through the initial development phase or through September 2002 whichever is first. Funding for the follow-on phases will be provided based upon the continuing need for the technology, the available budget, and the project performance and peer reviews.

2.5.1 Transuranic and Mixed Waste Focus Area Topic: Next Generation Hydrogen Gas Getters

2.5.2 Background: The Nuclear Regulatory Commission has imposed a limit on the concentration of flammable (hydrogen) gas – 5 percent by volume of hydrogen, the explosive limit of hydrogen in air – to minimize the potential for the loss of hazardous material when transuranic waste is transported in TRUPACT-II containers. This limit applies to the innermost layer of confinement within a drum or standard waste box. In order to prevent the explosive limit from being reached or approached, hydrogen gas getters (solid materials that remove hydrogen from the gas phase) have been investigated for removing hydrogen from the air inside the TRUPACT-II container.

2.5.3 Objectives/Needs: The objective of this research is to develop the next generation hydrogen gas getters. The current generation of hydrogen gas getters (sol-gel metal hydride, ceramic metal hydride, and polymer-microencapsulated materials) are expected to add about 30 kilograms to the waste drums and add about $16,000 per drum to the cost. Getter concepts that can reduce this weight by 50 percent and this cost by 75 percent are sought.

Some additional targets for acceptable getter concepts are listed below. This list may not be completely comprehensive, and it is expected that Proposers knowledgeable in this field will identify additional performance, functional, and technical requirements, and identify how their concept will meet those additional requirements, as well as those listed below. The getter concept shall:

- Collect irreversibly hydrogen under the wide conditions that may occur during transport (20 to 260 degrees Fahrenheit, and 0 to 50 psig).
- Have the ability to operate in the presence of other gases present in the transuranic waste (for example, halogenated and other volatile organic compounds).
- Have the ability to operate in a no oxygen environment.
- Produce no water as a reaction product.
- Operate as a passive system.
- Have the Ability to maintain hydrogen concentration under 5 percent for a period of 60 days in the presence of hydrogen gas generation rates of 1.2E-5 moles per second.
- Have the research basis so that the application of hydrogen getter materials in the TRUPACT-II container can be approved by the Nuclear Regulatory Commission prior to use.

2.5.4 Associated STCG Needs: AL-09-01-17-MW, ID-S.1.03 The listed STCG Numbers and Titles may be misleading. Many of these needs request activities in applied research, development, and demonstration in the same need. The needs are provided as background information and to generate ideas.

2.5.5 EMSP Related Research: 59934 (The listed EMSP project is not relevant to what Focus Area wants. The project is provided as background information and to generate ideas.)

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2.5.7 Special Requirements: Proposals for phased applied research and development efforts of two to three years are solicited. Proposals with shorter applied research and development periods will be viewed favorably. Initial awards will fund development efforts through the initial development phase or through September 2002 whichever is first. Funding for the follow-on phases will be provided based upon the continuing need for the technology, the available budget, and the project performance and peer reviews.

Getter concepts that have been previously funded by the Department of Energy, the Environmental Protection Agency, and the Department of Defense are not being sought at this time.

2.6.1 Transuranic and Mixed Waste Focus Area Topic: Next Generation Emissions Control and Monitoring for Non-Thermal Facilities

2.6.2 Background: The emission of hazardous gases (at all concentration levels, from low to high) and effluents from non-thermal processes continue to be an important issue for major stakeholders and regulators. In the future, both stakeholder expectations and proposed regulations are expected to become more stringent. However, there is no current standard practice for mitigating the generation of dioxins and furans in the off gas streams of non-thermal processes, and there are no off-the- shelf instruments for measuring dioxins, furans, and multiple metals at the off gas discharge point.

Previous studies have identified good production practices for thermal facilities that could be applied to non-thermal facilities: uniform high temperature; good mixing with sufficient air; minimized entrained, unburned particulate matter; feed rate uniformity; carbon monoxide and total hydrocarbons as indicators; and temperature at particulate control device.

2.6.3 Objectives/Needs: The objective of this research is to develop the next generation of emission and control concepts for non-thermal off gas facilities. Proposals are sought for concepts to:

- Understand if, for dioxin control in non-thermal treatment facilities, good mixing with sufficient air is a factor, feed rate uniformity is a factor, what emissions are indicators, and is the temperature at the particulate control device a factor.
- Mitigate the generation of dioxins and furans in the off-gas streams of non-thermal systems
- Continuously measure dioxins, furans, and multiple metals at the off gas discharge point of non-thermal facilities.

Some additional targets for acceptable emission and control concepts are listed below. This List may not be completely comprehensive and it is expected that Proposers knowledgeable in this field will identify additional performance, functional, and technical requirements, and identify how their concept will meet those additional requirements, as well as those listed below. The emission and control concept shall:

- Be able to meet the Methods Detection Limit (the minimum concentration of a substance that can be measured and reported, with 99 percent confidence that the analyte concentration is greater than zero, and with detection limit determined from an analysis of a sample in a given matrix type containing the analyte).
- Have in situ measurement capability.

2.6.4 Associated STCG Needs: ID-2.1.18, ID-S.1.02 The listed STCG Numbers and Titles may be misleading. Many of these needs request activities in applied research, development, and demonstration in the same need. The needs are provided as background information and to generate ideas.

2.6.5 EMSP Related Research: 60070, 73844 (The listed EMSP projects are not relevant to what Focus Area wants. The projects are provided as background information and to generate ideas.)

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2.6.7 Special Requirements: Proposals for phased applied research and development efforts of two to three years are solicited. Proposals with shorter applied research and development periods will be viewed favorably. Initial awards will fund development efforts through the initial development phase or through September 2002 whichever is first. Funding for the follow-on phases will be provided based upon the continuing need for the technology, the available budget, and the project performance and peer reviews.

Control and monitoring concepts that have been previously funded by the Department of Energy, the Environmental Protection Agency, and the Department of Defense are not being sought at this time.

3. Deactivation and Decommissioning Focus Area:

3.1.1 Deactivation and Decommissioning Focus Area Topic: Facilities and Equipment Characterization

3.1.2 Background: Characterization efforts are required prior to preparing decommissioning plans and to starting actual decommissioning and deactivation (D&D) operations, as well as for final surveys to verify the successfulness of decontamination activities. Many DOE facilities contain areas having very high radiation fields. The process of collecting detailed characterization data from these areas often results in high radiation exposure to the members of the characterization team. In an effort to reduce worker exposure to as low as reasonably achievable (ALARA) levels, decisions are often made to accept less characterization data with a resulting loss of information necessary to safely and effectively execute the D&D project.

3.1.3 Objectives/Needs: Improvements are needed in characterization to quickly and easily differentiate between contaminated and non-contaminated concrete and metal surfaces and structures in order to improve the efficiency with which follow-on D&D activities are completed. These improved systems should conclusively determine the type of contamination, the cross-sectional profile of existing volumetric contamination, and the amount of contamination on and in concrete and metal. In addition, new characterization technologies should be able to measure contamination, on a contaminant-by-contaminant basis, down to the site free-release levels.

Recent advances in basic science supported by DOE, academia, and other government and private sector R&D organizations are encouraging and suggest that a new class of chemical sensing materials may soon be available for commercial applications. Some EMSP projects conducting research in this area are listed in Table 1. These projects are investigating improved sensing materials including strongly complexing ligands and crown ethers, crystalline colloidal array polymers, fluorescence quenching based on photoinduced electron transfer, and conductive polymers. The aim of this research is to develop sensor systems with a high degree of molecular recognition selectivity and sensitivity.

There is a need to develop integrated characterization methods for radiological, hazardous, and toxic materials to enhance the effectiveness of D&D. Accurate characterization of radioactive contamination is needed to distinguish between low-level waste and free-release waste. Improved characterization of hazardous materials (i.e., solvents, oils, etc.) and RCRA metals is needed to meet RCRA requirements, and characterization of toxic substances (i.e., PCBs, asbestos, etc.) directly ties into meeting TSCA requirements. An all-encompassing data management system with high-speed measurement devices that integrates multiple characterization information would significantly reduce characterization time and cost. Ideally, a real-time integrated approach (i.e., mapping capabilities, electronic downloading of data, data integration and analysis, and compliance with NUREG 1575, (Multi-Agency Radiation Survey and Site Investigation Manual) that is capable of addressing radiological, hazardous, and toxic characterization needs is desired. Specific functional requirements and areas where R&D can provide significant advances leading toward improved characterization techniques include:

- ability to characterize unique and complex surface geometries, cracks, joints, and crevices;
- ability to characterization vertical and horizontal (including ceilings) surfaces, both above and below grade, as well as for underwater characterization and visual inspection;
- ability to accurately determine hot spot location and sensitive enough to allow unrestricted release of decontaminated facilities/equipment; and,
- real-time characterization data analysis to support and guide decontamination and material sorting efforts.

Of particular concern is the ability to verify the existence or absence of contamination in inaccessible areas such as underground tanks and process piping, drain lines, ventilation ducts, and wall cavities. In order to abandon, continue using, remediate, or exhume many of these lines, it is necessary to know if the systems contain residual contamination above release levels, or if the integrity of the system has been compromised and radioactive contaminants have entered the surrounding structures and soils. The current alternative is to dismantle significant portions of a facility or system to adequately sample, analyze, and verify its cleanliness. It would be beneficial from both financial and ALARA considerations to characterize any potential residual radiological contamination in situ before proceeding with remediation or release. Non-intrusive, non-destructive techniques are needed to minimize dismantlement requirements and to facilitate the reuse of facility piping and ventilation systems. The process and drain lines hardest to characterize are the small bore pipes (as small as one inch in diameter) buried underground or inaccessible due to facility structures (e.g., encased in concrete). Proposed research should concentrate on solving this problem. Opportunities exist for remote sampling, real-time characterization, and improved visual inspection methods for tracing and spatially locating highly contaminated piping systems. New methods of characterizing small bore pipes and ventilation ducts will result in significant cost savings through less dismantlement work, less decontamination work, less drain line pulls, less flushing, and less generated waste. Specific requirements for improved sampling and characterization systems for inaccessible areas and small bore pipe systems include:

- in-situ sample collection (from a few cubic centimeters to a few hundred centimeters) of solids, sludges and liquids;
- quantitative isotopic analysis and visual inspection of piping runs up to 250 feet;
- sensors capable of being deployed inside pipes as small as 1 inch and ranging up to 4 inches;
- capable of conducting non-destructive surveys in a highly radioactive environment (up to 500 R/hr, more typically up to 10 R/hr) and in the presence of process chemicals, acids, and caustic solutions; and,
- portable, real-time characterization and analysis for standard fission products, activation products, heavy metals and other hazardous contaminants (PCBs, lead, asbestos, etc).

3.1.4 Associated STCG Needs: AL-00-01-02-DD; CH-DD01-99; CH-DD11-99; ID-7.2.06; ID-7.2.15; ID-7.2.17; ID-7.2.20; NV09-0001-09; NV10-0001-10; OH-C901; OH-M901; ORDD-01; ORDD-12; RF-DD02; RL-DD031; RL-DD033; RL-DD036; RL-DD037; RL-DD038; RL-DD039; RL-DD040; **RL-SNF01**; SR00-4002; SR00-4005; SR00-4007 (**Bolded** Need has been assigned by the DOE sites to an OST Focus Area other than DDFA, but is applicable to the described research topic area.)

3.1.5 EMSP Related Research: 64982; 65001; 65004

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3.2.1 Deactivation and Decommissioning Focus Area Topic: Monitoring of Facilities to Support Long-Term Surveillance and Maintenance

3.2.2 Background: Many DOE sites require remote surveillance of production areas, structures, utilities, equipment, drums, tanks, effluent lines, etc. Currently, facilities awaiting deactivation and decommissioning must be periodically surveyed for various criteria including contamination levels, structural deterioration, water intrusion, animal intrusion, integrity of storage containers, atmospheric conditions, and radioactive and hazardous substance releases. The surveys themselves are intrusive, time-consuming, and expensive, and they expose survey personnel to radioactive contamination and radiation. Low-cost, low-maintenance remote surveillance systems capable of collecting data from a DOE site (remote station) and transmitting the data to a central location (base station) are needed. Ideally, these systems should be developed in a modular fashion so as to be easily applicable to individual site needs as they arise or change. Ease and automation of calibration and maintenance of these systems is desired.

3.2.3 Objectives/Needs: New systems to address long-term S&M include remote in-situ techniques to visually inspect facilities and structures as well as to detect, spatially locate and quantify contaminants of concern in, around and under facilities to determine existing conditions and for detecting future releases to the environment. These improved systems should integrate state-of-the-art data management to facilitate long-term S&M and final disposition planning. New systems must be capable of storing and tracking characterization data, as well as visual and spatial images of the facility and associated equipment and waste. These system should be capable of receiving input data from facility drawings, photographs, videos, laser range finders, gamma cameras, site databases, waste inventories and computer aided design packages. These systems should also be able to be controlled from remote locations and be capable of sending and accessing data from anywhere via phone, computer, or cable lines.

3.2.4 Associated STCG Needs: **RL-DD01**; RL-DD011; RL-DD023-S; RL-DD027-S; RL-DD033-S; RL-DD035; **RL-DD041**; RL-DD047; RL-DD050; RL-DD052; RL-DD053; RL-DD054; RL-DD055; RL-DD056; RL-DD057; SR00-4010 (**Bolded** Needs have been assigned by the DOE sites to an OST Focus Areas other than DDFA, but are applicable to the described research topic area.)

3.2.5 EMSP Related Research: 65015; 60141

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3.3.1 Decontamination and Decommissioning Focus Area Topic: Characterization to Support Segregation/Disposition of TRU-contaminated Material

3.3.2 Background: Large volumes of transuranic (TRU) and non-TRU waste are currently stored throughout the DOE Complex and D&D operations will generate considerable larger volumes. All TRU waste—generated or stored—must meet Waste Isolation Pilot Plant (WIPP) waste acceptance criteria (WAC) before final disposal. Materials containing RCRA components must be disposed of as mixed waste (MW). Improvements are needed in waste characterization to quickly assay materials prior to packaging. These systems should be capable of distinguishing between TRU, and low-level waste (LLW), as well as down to free release limits (below 100 dpm/100 cm^2). Innovative techniques will improve the overall efficiency of D&D activities, improve material segregation processes, and reduce the volume of waste destined for disposal at WIPP or at on-site LLW waste sites.

3.3.3 Objectives/Needs: Because of the low emission rate of gamma rays from the radionuclides of concern, measurement of the alpha emissions is the standard approach to measure fixed surface contamination. Measurement of the alpha activity requires the detector to be in close proximity to the surface. For flat and easily accessible surfaces, current characterization methods are often adequate for measuring alpha emissions. However, it is a much greater challenge to characterize radioactivity within pipes, ducts, tanks, and gloveboxes. In many instances it is necessary to dismantle equipment internally contaminated with alpha emitting radionuclides (Pu-238, Pu-239, Am-241) in order to expose all of the surface areas so that a survey instrument can be placed in close contact with the surface. Sometimes this is not economically possible and the equipment must be disposed of as TRU (or low level waste) based on process knowledge of where the waste was generated.

Improved techniques (e.g., in situ or non-destructive techniques) are needed that eliminate the necessity to size reduce or dismantle equipment to characterize generated D&D wastes including pipes, ducts, tanks, gloveboxes, and other inaccessible structural and equipment surfaces. The ability to distinguish between TRU and LLW contamination is useful for decision making throughout the D&D process by helping determine whether and where decontamination efforts are needed or how best to size reduce material to isolate TRU waste from LLW. Perhaps the greatest benefit of using improved characterization technologies would occur during segregation of waste material prior to its packaging, certification, and disposal. The ability to segregate TRU waste from LLW more effectively and efficiently prior to packaging can result in greatly reducing the amount of low-level material that is classified and managed as TRU waste. Specific requirements for improved characterization systems include:

- alpha and gamma spectroscopy to provide isotopic information on the radionuclides of concern;
- ability to correct for high background levels of contamination;
- capable of measuring contamination within complex shapes and interior spaces, and beneath painted surfaces;
- capable of real-time counts with better accuracy and precision than baseline technologies;
- ability to measure to below free release limits;
- mobile systems that are easily deployed in the field (i.e., portable);
- minimal training requirements for technicians; and,
- electronically track waste material characterization data to assist in critical go/no-go decision for packaging.

In addition to improved systems for detecting and quantifying low-energy gamma TRU waste, a new class of field-applicable neutron detectors is needed to measure and sort remote-handled (high gamma radiation) low-level waste containing transuranic materials. The transuranic content of waste with high levels of cesium-137 and moderate levels of TRU has been established in the past by an indirect method based solely on dose rate measurements and limited sampling and analysis. This approach is now in

question. Advances in neutron-gamma discrimination in scintillator materials are needed so that a new class of neutron detectors may be manufactured for sorting transuranic-containing remote-handled LLW.

3.3.4 Associated STCG Needs: AL-00-01-08-DD; **AL-08-01-17-MW**; AL-09-01-11-MW; **OH-WV-901**; RF-DD01; RF-DD04; RL-DD05; RL-DD035-S; RL-DD060; SR00-4011 (**Bolded** Needs have been assigned by the DOE sites to an OST Focus Area other than DDFA, but are applicable to the described research topic area.)

3.3.5 EMSP Related Research: 55247; 60217

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3.4.1 Deactivation and Decommissioning Focus Area Topic: Next Generation Decontamination Technologies (metal and concrete)

3.4.2 Background: Many baseline commercially available techniques exist to decontaminate contaminated concrete and metal surfaces. Most techniques, however, are labor intensive directly exposing workers to radiation fields. Additionally, most processes are slow and generate some form of secondary waste and airborne contamination. Over the past several years the D&D Focus Area has successfully developed and deployed systems that are more cost-effective and that reduce worker exposure risk, yet opportunities exist for new approaches and a class of significantly improved technologies for decontamination of concrete and metal surfaces.

3.4.3 Objectives/Needs: At the core of these advancements is the need to better understand the fundamental chemistry of adsorption and binding of radioactive isotopes (and other hazardous contaminants) to the surface matrix. Opportunities exist to develop recyclable chelants to minimize secondary waste and to modify high tech extractant molecules, developed to extract radiounuclides form solution, to operate on surface bonded contaminants. For metal surfaces, surface science studies and solid state chemical modeling are needed to characterize the interaction of the contamination with corrosion and oxidation products and organics (e.g., paint and oil). Segregation and trapping of radioactive species at defects (e.g., pores, weldments, or cracks) would also benefit surface science studies and modeling. For concrete surfaces, fundamental studies are needed on physical/chemical binding of radionuclides to bare and weathered concrete and painted concrete surfaces. Mesoscale modeling and experiments are needed to characterize flow and percolation of fluids through porous and fractured concrete surfaces. The influence of chemical, mechanical, and biological processes on the physical properties and fracture of concrete require characterization. These data will lead to the development of more efficient chemical and biological processes for decontamination.

Due to the many types of contaminants and the wide variety of surface configurations that are contaminated throughout the DOE complex, it is virtually impossible to define a unique set of functional requirements that will lead to the “next generation” of decontamination technologies. Major isotopes of concern vary from site to site and can be found as either fixed or removable contamination on the surfaces of walls, floors, equipment (both internal and external) and other bulk materials. Some specific contaminants of interest include plutonium oxides (holdup), tritium (volumetric contamination), mercury, cesium and strontium, technetium, americium, and thorium, PCBs and lead (including lead and PCB based paints). Generally, opportunities exist for improved decontamination systems that:

- integrate remote deployment capabilities so that workers are removed from hazardous environments;

- generate less secondary waste;
- achieve higher decontamination factors in a single application;
- eliminate or effectively contain airborne dust and contaminants;
- can decontaminate cracks, crevices, and welds
- can decontaminate a broad range of equipment geometries and process configurations, including the ability to perform internal (or in situ) decontamination thus minimizing the need to disassembly of process equipment;
- are capable of decontaminating vertical and horizontal (including ceilings) wall surfaces both below and above grade, and leave minimal areas along intersections of walls and floors that are contaminated;
- are portable and less labor intensive;
- include sensors and real-time operator feedback to pinpoint contaminated areas and to evaluate the decontamination process as it proceeds; and,
- systems that result in essentially complete decontamination so that the remaining material can be release for unrestricted use.

3.4.4 Associated STCG Needs: AL-00-01-06-DD; AL-07-01-12-DD; AL-07-01-13-DD; AL-09-01-12-DD; CH-DD07-99; CH-DD08-99; ID-7.2.03; ID-7.2.24; ID-7.2.25; ID-7.2.26; ID-S.2.05; ID-S.2.06; OH-M902; ORDD-02; ORDD-03; ORDD-06; ORDD-08; RF-DD09; RF-DD10; RL-DD022-S; RL-DD03; RL-DD034-S; RL-DD036-S; RL-DD044; RL-DD046; RL-DD06; RL-DD063; **RL-SNF02**; SR00-4003; SR00-4004; SR00-4015 (**Bolded** Need has been assigned by the DOE sites to an OST Focus Area other than DDFA, but is applicable to the described research topic area.)

3.4.5 EMSP Related Research: 54914; 55380; 54724; 59925; 60363; 60283; 64865; 64896; 64907; 64912; 64931; 64946; 64947; 64965

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3.5.1 Deactivation and Decommissioning Focus Area Topic: Improved Size Reduction and Demolition Techniques

3.5.2 Background: During dismantlement operations, equipment, structures, and buildings must be size reduced to facilitate handling and packaging for disposal. Most baseline methods for size reduction result in residues and airborne contaminants that must then be controlled, handled, and disposed. Improved technologies are needed to size reduce and demolish highly-contaminated processing equipment and facilities that reduce or eliminate the cutting residues, dust generation, and/or airborne contaminants. Non-thermal cutting techniques that will reduce or eliminate the volatilization of contaminants are of particular interest, as are advanced laser cutting and high-pressure water techniques.

3.5.3 Objectives/Need: The primary drivers for improved size reduction and demolition systems are worker safety and increased productivity. Many size reduction operations require workers to work above the floor (up to 30 feet high) on ladders, scaffolding, and/or man-lifts with hand-held tools (power saws, torches, etc.) The work is labor-intensive and requires significant safety awareness and many precautionary measures because of the heights involved. Further, due to potential exposure and ALARA concerns, these workers are suited in anti-contamination clothing and typically work limited periods of time. Thus, another general requirement desired for improved systems resulting from this research is that the technology be remotely deployed or compatible with remote deployment platforms or overhead crane systems. These systems should combine real-time visual feedback and other sensor capability to monitor

the dismantling processes as they proceed. Automated or teleoperated systems will reduce worker exposure and make size reduction/demolition operations more cost effective.

Equipment needing size reduction includes pipes, vessels, tanks, ducts, gloveboxes, oversized TRU-contaminated materials, etc. Facility demolition includes the dismantlement of massive metal and concrete (including reinforced concrete) structures. Improved technologies resulting from this research will be dependent on the item to be size reduced; its size, shape and the material it is made of.

Some specific requirements for improved equipment size reduction include:

- ability to cut, crimp, and handle process piping (up to 10 foot sections) including preventing the release of liquid or gas
- ability to cut a wide range of diameters (from a 0.5-inch up to two feet) with varying wall thicknesses (e.g., schedule 10 to schedule 40 stainless steel);
- ability to size reduce free standing, vertical or horizontal materials, and equipment in congested areas or against walls;
- ability to size reduce equipment at elevated locations;
- ability to cut complex geometries;
- ability to size reduce concrete-encased equipment and piping (e.g., Savannah River and Rocky Flats needs); and,
- ability to perform underwater size reduction (e.g., Hanford, Idaho, and Savannah River fuel pools) with negligible impact on water clarity
- ability to cut stainless steel piping and equipment .

Some specific requirements for improved facility dismantlement/demolition include:

- ability to cut I-beams and solid metal up to 12 inches thick ;
- ability to dismantle concrete and reinforced concrete walls (typically 6 inch walls but can range up to several feet thick); and
- ability to work at heights of 40 feet and handle pieces of metal, rebar, or concrete weighing up to 1,000 pounds.

3.5.4 Associated STCG Needs: AL-00-01-01-DD; AL-00-01-05-DD; AL-00-01-07-DD; AL-00-01-12-DD; CH-DD01-00; CH-DD06-99; ID-7.2.12; ID-7.2.21; ID-7.2.28; ID-7.2.29; ID-7.2.30; ID-7.2.31; NV07-0001-03; OH-F010; OH-F027; OH-WV-910; ORDD-07; ORDD-09; RF-DD11; RF-DD17; RF-DD20; RF-DD21; RL-DD02; RL-DD030; RL-DD08; **RL-SNF05**; SR00-4001; SR00-4008 (**Bolded** Need has been assigned by the DOE sites to an OST Focus Area other than DDFA, but is applicable to the described research topic area.)

3.5.5 EMSP Related Research: None on current list

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3.6.1 Decontamination and Decommissioning Focus Area Topic: Systems to Reduce Worker Heat Stress

3.6.2 Background: There are numerous areas for technology development concerning worker protection due to the broad range of health and safety needs. Industrial needs concern trauma related protection such as protection from falls, eye and hearing protection, hand and head protection, and heat and cold stress protection. Hazardous and radiological concerns include inhalation monitoring and protection and skin protection.

D&D activities are especially vulnerable to heat stress cases because many of the contaminated facilities that are involved in deactivation or decommissioning no longer have active ventilation or cooling systems. In addition, due to the radiological and hazardous environments, workers are often dressed in double protective clothing, which increases heat stress potential. To mitigate heat stress potential, workers oftentimes wear cooling vests but their increased weight causes workers to tire more quickly and restricts their mobility, thus decreasing the workers productivity.

3.6.3 Objectives/Needs: New cost-effective protective clothing and heat stress mitigation systems are necessary. Some specific requirements include:

- safe, lightweight, comfortable and durable; equipment must meet all relevant regulatory requirements (i.e., OSHA regulations);
- capable of being decontaminated and reused or disposed of with no major cost;
- provide increased mobility and must increase the effective worker productivity; and,compatible with existing personal protective equipment and must not use hazardous chemicals to bring about the cooling effect.

Related to this issue is an opportunity to employ improved real-time monitoring instruments to determine the level of personal protection required, including upgrades and downgrades in the level of protection (A, B, C, D) as variations in contamination levels occur. The primary driver is cost savings based on improved worker productivity and less waste management and disposal costs of reusable garments. Integrated heat stress monitoring systems are also needed, which provide accurate, real-time measurement of human vital signs. These monitoring systems should be capable of collecting vital sign data remotely for several workers (up to 20) simultaneously. The capacity to transmit remotely collected data through obstructions such as structures and building materials to a central receiving station is required. Additionally, data collection and analysis should be available electronically, in real time.

3.6.4 Associated STCG Needs: CH-DD04-99; OH-F042; RF-DD08; SR00-4016

3.6.5 EMSP Related Research: None on current list

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3.7.1 Deactivation and Decommissioning Focus Area Topic: Airborne Contaminants/Emissions Monitoring and Control Systems

3.7.2 Background: As decontamination and dismantlement of contaminated structures continues around the DOE Complex, the concern for radiological workers who may be exposed to airborne contaminants resulting from mechanical disturbances (soil removal, truck traffic, falling building debris, etc) and from extreme meteorological conditions (high winds and gusts) must be addressed.

3.7.3 Objectives/Needs: Improved air monitoring and contaminant control systems are needed to ensure worker protection and the success of the overall D&D operation.

With our current understanding of the fundamental processes of air sampling, coupled with new technologies for detection, data analysis, and information storage and retrieval, older monitoring instrumentation designs have become obsolete. Real-time continuous air monitors are needed that provide workers with an “alarm” function to notify workers when airborne contaminants are detected within a work area. Improved air monitoring systems are needed for all classes of radionuclides (e.g., alpha, beta/gamma emitters) as well as for other hazardous contaminants. Detection limits and other

instrument parameters must be compliant with the established project thresholds. The Rocky Flats and Mound sites have identified specific air monitoring needs. Mound's air monitoring needs are for detecting stable tritiated particulates (STPs) and stable metal tritides (SMTs). Rocky Flats desires air monitors to measure all types of beryllium inhalation hazards including salts, oxides, and metals. The monitor must possess sufficient sensitivity, accuracy, and precision to verify meeting or exceeding the site action limit and other limits. The site action limit is 0.5micro-g Be/m3, the OSHA 8-hour time weighted average is 2.0micro-g Be/m3, the OSHA peak is 5.0micro-g Be/m3 (15-minute cumulative sample), and the OSHA ceiling is 25.0micro-g Be/m3. A good lower detection limit at or near 0.1micro-g Be/m3 would have implications relevant to reducing PPE requirements and the subsequent costs associated with disposal.

In addition to monitoring airborne contamination, improved control methods are desired for airborne particulate contamination created during decontamination and size reduction activities taking place within radioactively-contaminated buildings. As workers start decontamination or size reduction operations, the potential exists for the release of radioactive particles and the generation of dust contaminated with other hazardous materials such as lead, beryllium, PCBs, and asbestos. Dust control can be accomplished in two fundamental ways: (1) creation of dust can be reduced or eliminated, and (2) dust that is created can be controlled. Though reducing the generation of dust is generally the preferred option, (discussed further under D&D Research Topics 2 and 3 within this solicitation), improved control systems are desired. Current dust control methods for interior decontamination work and size reduction activities are expensive and inefficient, with the potential of cross contamination, worker exposure, fire hazards, and environmental releases.

Improved fixatives are one method being sought to control airborne contamination and to fix removable contamination on facility and equipment surfaces. Current fixative techniques are ineffective allowing leaching of radioactive material, build up of hydrogen and/or helium over time, are relatively high in cost to apply/remove, and may create a mixed waste. A better understanding is needed of contamination chemistry and the surface binding mechanism to allow for optimal fixative methods to be developed.

In general, long-life (20 to 25 years) cost-effective fixatives are needed to immobilize dispersible alpha, beta, and gamma contamination. These fixatives should be applicable for a variety of contaminants (Cs, Sr, Pu, U, Pb, and other RCRA metals) and surfaces (e.g., coated and uncoated concrete, cement covered with asphalt, coated and uncoated carbon steel and stainless steel). The products must be easy to apply. Automated and/or remote application is desirable, including improved delivery systems for equipment internals (e.g., process piping, ventilation ducts and gloveboxes). The fixative must also be easily removed to allow for eventual decontamination. Fixatives are needed for underwater application as well as for dry application. Other desired improvements over baseline fixatives include a wet/dry indicator and a non-tacky dried surface.

Other methods of controlling airborne contamination will also be considered within the context of this research topic. This could include temporary (sarcophagus) or semi-permanent localized ventilation and HEPA filtration systems. The systems shall be portable, reusable, and easily constructed and decontaminated. The materials of construction should be non-hazardous and generate less waste compared to plastic containment huts or tents. The proposed ventilation system should maintain an acceptable air quality in the work spaces while at the same time preventing above-limit releases to the environment is needed. The system should be able to be connected to a facility's ventilation ducts, if still available and in working order. As an alternative, the ventilation system could provide its own ducting. The ventilation system shall have interchangeable components so a surplus facility can customize with different capacity fans and different efficiency filters. The filtration system shall utilize high efficiency, regenerable filters. The ventilation system shall meet the applicable regulations in terms of how efficient it must be in removing particulates from the air. The ventilation system must provide a specified number of air exchanges per hour (or per day) to meet the industrial hygiene standards for worker occupied areas. The ventilation system shall be able to maintain a slightly negative pressure differential on the building (approximately 0.1 inches of water). Improvements in HEPA filter design, electrostatic precipitators and mini-cyclones are also viable proposed research topics.

Also considered under this topic is research leading to a better understanding of the particle size distribution associated airborne contaminants generated during D&D activities (e.g., radioactive aerosols, smoke generated from different cutting techniques, etc.) and the disposition of the particles on environmental continuous air monitor (ECAM) filters. Fundamental knowledge advancements are needed with regard to alpha particle air monitors that discriminate between radon and other alpha emitters. This research would allow for the development of optimal monitoring and capture/filtration technologies.

3.7.4 Associated STCG Needs: AL-00-01-03-DD; AL-00-01-04-DD; AL-09-01-02-DD-S; OH-M011; OH-M903; OH-M909; RF-DD03; RF-DD18; RL-DD025-S; RL-DD026-S; RL-DD032; RL-DD04; RL-DD045; RL-DD062; RL-DD07; **RL-SNF03**; SR00-4009; SR00-4013 (**Bolded** Need has been assigned by the DOE sites to an OST Focus Area other than DDFA, but is applicable to the described research topic area.)

3.7.5 EMSP Related Research: 60163; 60474; 59882

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3.8.1 Deactivation and Decommissioning Focus Area Topic: Advanced Manipulators and End Effectors for D&D Operations

3.8.2 Background: Manipulator systems remain too expensive and too often restrictive in terms of their task capabilities.

3.8.3 Objectives/Needs: Reconfigurable manipulators using joint actuator and link components offer a means to alleviate these problems, but fundamental design breakthroughs are needed in order to achieve the desired performance capabilities necessary in the payload ranges associated with D&D tasks. Power-to-weight ratio increases of an order of magnitude are needed. Advanced materials and fundamental actuation principles should be considered. Consideration will be given for both electrohydraulic and electromechanical actuators. Theoretical knowledge is also needed for mapping task geometry and force requirements and constraints into manipulator joint/link sequence configuration requirements. The goal of this work is the development of an entirely new generation of actuators capable of operating under extreme conditions.

In additional to developing advanced manipulator systems, advances in end effectors are also required. The standard end effector used in nuclear applications is the single degree-of-freedom parallel jaw gripper, which depends on high grip force and friction to hold tools and objects in stable positions. Often, special tool grips are added to enhance gripping stability. Multi-fingered end effectors that intrinsically provide stable grasping as well as greater degrees of freedom necessary to grasp complex objects (e.g., curved surfaces) are needed. Considerable fundamental research in multi-fingered grasping and control has been previously performed, hence proposed R&D should focus on concepts and designs that will lead to field deployable systems compatible with the types of manipulators and task requirements that are indigenous to D&D.

3.8.4 Associated STCG Needs: Research topic was derived from DOE department-wide roadmap for robotics and intelligent machines, and developed for DDFA with support from the OST Robotics Crosscut Program. Nearly 30 percent of all FY00 DDFA needs had requirements for remote/robotic applications. Specific FY00 needs within research area include: ID-7.2.08; ID-7.2.18; OH-M010; OH-WV-903; OH-WV-909; RL-DD010; RL-DD061; **SR00-2031** (**Bolded** Need has been assigned by the DOE sites to an OST Focus Area other than DDFA, but is applicable to the described research topic area.)

3.8.5 EMSP Related Research: None on current list

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3.9.1 Deactivation and Decommissioning Focus Area Topic: Tetherless Power and Communication Systems

3.9.2 Background: Power transmission to remote platforms is typically done with large, cumbersome, and high-voltage cable tethers. These massive tethers severely restrict mobility and range.

3.9.3 Objective/Needs: Innovative new propulsion systems are needed that provide reasonable operating times and do not present potential fire hazards. Hybrid electrical propulsion systems which use battery power storage and electric drives to meet high power demands show real promise for remote system applications. Research is required to develop self-contained and light weight power supplies for hybrid electric systems. Closed operation fossil-fueled internal combustion engines and fuel cell systems are also viable power supply research options for consideration in this area.

Remote D&D work systems typically use tethers to communicate between the work system and the control station. Tethers restrict system operation and lead to serious problems with regard to reliability and maintainability. A fundamental understanding of data communication requirements associated with telerobotic D&D work systems are needed. This should also address the varying types of environments that D&D operations typically take place in (e.g., within structures with dense reinforced concrete or steel structures, etc). The proposed research should include development of a data communication approach that uses modern technology (e.g., cellular communications) to achieve wireless data links. High density visual sensor data requirements should also be addressed.

3.9.4 Associated STCG Needs: Research topic was derived from DOE department-wide roadmap for robotics and intelligent machines, and developed for DDFA with support from the OST Robotics Crosscut Program. Nearly 30 percent of all FY00 DDFA needs had requirements for remote/robotic applications. Specific FY00 needs within research area include: ID-7.2.08; ID-7.2.18; OH-M010; OH-WV-903; OH-WV-909; RL-DD010; RL-DD061; **SR00-2031** (**Bolded** Need has been assigned by the DOE sites to an OST Focus Area other than DDFA, but is applicable to the described research topic area.)

3.9.5 EMSP Related Research: None on current list

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3.10.1 Deactivation and Decommissioning Focus Area Topic: Advanced Systems Control and Task Planning

3.10.2 Background: The primary driver for implementing today's teleoperated and supervisory-controlled remote systems is to remove the worker from dangerous and hazardous environments. Advanced, fully autonomous remote systems will continue to satisfy this primary driver as well as provide drastic productivity increases, thereby lowering D&D operating costs. Advanced sensing and computer-based task planning are essential for the advancement of teleoperated remote systems to fully autonomous systems for D&D operations.

3.10.2 Objectives/Needs: Sensor-based methods are needed to control manipulation systems, including D&D tooling that allow the systems to autonomously perform coarse through fine task operations within the complex and obstacle strewn environments typical of D&D activities. These methods should include all forms of control from position control through force/impedance control under contact conditions. The methods should also address all classes of remote manipulation systems that are used in D&D in terms of size, actuation, and payload. Compatibility with telerobotic implementation where the system functions seamlessly between manual and autonomous control

should be considered. All types of sensor modalities will be considered including vision-guided manipulation.

A key ingredient in the realization of autonomous systems for D&D tasks is computer-based task planning in which task and tooling characterization are used to generate executable computer instructions for the desired task execution. Given the complexity of D&D task scenarios, task planning is an extremely difficult process to fully automate. Advances in computerized task planning that is operator interactive are needed. Human-operator interactivity should be designed such that the maximum amount of planning is automated in a given scenario. Human factors science should be considered as a basis for the design of the human interactivity constructs. Also, machine learning schemes should be considered as a means to capture and encode human task planning inputs to achieve higher degrees of automated task planning in future system operations.

3.10.4 Associated STCG Needs: Research topic was derived from DOE department-wide roadmap for robotics and intelligent machines, and developed for DDFA with support from the OST Robotics Crosscut Program. Nearly 30 percent of all FY00 DDFA needs had requirements for remote/robotic applications. Specific FY00 needs within research area include: ID-7.2.08; ID-7.2.18; OH-M010; OH-WV-903; OH-WV-909; RL-DD010; RL-DD061; **SR00-2031** (**Bolded** Need has been assigned by the DOE sites to an OST Focus Area other than DDFA, but is applicable to the described research topic area.)

3.10.5 EMSP Related Research: 55052; 60040

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4. Subsurface Contaminants Focus Area:

4.1.1 Subsurface Contamination Focus Area Topic: Tritium Monitors for Groundwater

4.1.2 Background: The U.S. Department of Energy (DOE) requires down-hole tritium monitors to perform low-level radiation measurements on groundwater in shallow, intermediate, and deep monitoring wells at DOE Nuclear Complex sites, where tritium is the principal radionuclide. Expeditious Exploratory and Advanced Development with subsequent field demonstration are desired for qualifying technologies, as there is a desire to have a technology or technologies for field demonstration and deployment as soon as possible. The DOE sites which have been selected for initial demonstration of tritium monitors are the Nevada Test Site (NTS) and Lawrence Livermore National Laboratory (LLNL). Currently the NTS has approximately 250 wells from which to take readings, and LLNL currently has in excess of 200 wells.

At NTS there is estimated to be 100 million Curies (Ci) of tritium potentially available to the groundwater. It is anticipated that groundwater at the site will require monitoring for tritium for approximately 100 years. Technology currently available to DOE for in-situ measurement of tritium concentration cannot achieve the performance specifications required to provide detection of low concentrations of tritium within the physical constraints of deep hydraulic systems. Some technologies examined in the past are too large for down-hole use, while others suffer from unproven reliability (calibration stability) or have insufficient detection limits. In addition, the impact of the geochemical composition of the groundwater on the detection limits of these commercially available instruments is uncertain.

4.1.3 Objectives/Needs: Technologies are sought that fulfill the following performance requirements:

- Maximum outside sensor diameter of 1.75 inch (4.45 cm) to be deployable down-hole (i.e., fit inside of a 2-inch (5.08-cm) diameter well).
- Capability to log measurements as frequent as daily.
- Duty cycle of at least 25 years, with maintenance required no more than yearly.
- Ability to withstand the harsh operating conditions of a deep well environment: depths of 800 to 5,000 ft (244 to 1,525 m) (target depth for performance: 2,000 ft (610 m)), pressures of 0 to 1,800 pounds per square inch, and temperatures from 50 to 165°F (10 to 74°C).
- Minimum resolution of 1,000 picoCuries per liter (pCi/L) (as low as 200 pCi/L is preferable), with a range of 1,000 to 200,000 pCi/L at an accuracy of ±10%.
- Capability to interrogate a vertical zone of interest up to 12 inches (30 cm).
- Incorporation of measurement capabilities for other physical properties, specifically total conductivity, gross gamma, pH and temperature (additionally gross alpha and dissolved oxygen are beneficial).

While the primary intent of this solicitation need is to fulfill the more stringent requirements of the NTS listed above, DOE is willing to entertain proposals that address the less stringent groundwater tritium monitoring needs of other sites, such as LLNL. At LLNL's Site 300, tens of Ci of tritium exist in ground water and several Ci are present in the vadose zone. LLNL's requirements are identical to those of NTS with the following exceptions:

- Maximum outside sensor diameter of 4 inches (10.16 cm) to be deployable down-hole (fit inside a 4.5-inch (11.43 cm) diameter well).
- LLNL requires devices that can withstand depths of 20-400 ft below ground surface and temperatures of 20-30° C.
- LLNL desires an instrument with an upper limit on the detection range of 2 Million pCi/L.

Generally, the well locations at all interested DOE sites are remote with no conventional electricity available (requires battery or solar power -- or other alternatives where applicable). Preferably, the units would require no periodic calibrations, but if required, the calibrations should be easy to perform in-situ. The technology must be capable of remotely downloading data and should include a self-diagnostic system including alarms for loss of signal or power, etc. The technology must result in significant cost savings over baseline monitoring methods. Under the current DOE baseline method, large volumes of water are pumped from deep wells with either dedicated pumps or pumps installed for each sampling, and water samples are sent to on-/off-site laboratories for analysis. Ultimately, the technology must be acceptable to regulators and stakeholders.

4.1.4 Associated STCG Needs: NV01-0001-01S, OK99-21

4.1.5 EMSP Related Research: None on current list

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4.1.7 Special Requirements: It is anticipated that this development effort will initiate at Exploratory Development (Stage 3) or Advanced Development (Stage 4) level. It is requested that optional phase(s) will be included in proposals to extend development through Demonstration (Stage 6).

4.2.1 Subsurface Contaminants Focus Area Topic: Tritium Monitors for Soil Gas and Vapor Measurements

4.2.2 Background: The U.S. Department of Energy (DOE) requires detectors for in-situ measurements of tritium in soil gas and vapor in the vadose zone. Expeditious Exploratory and Advanced Development with subsequent field demonstration are desired for qualifying technologies, as there is a desire to have a technology or technologies for field demonstration and deployment as soon as possible. The DOE sites which have been selected for initial demonstration of tritium monitors are the Nevada Test Site (NTS) and Lawrence Livermore National Laboratory (LLNL). Currently the NTS has approximately 250 wells from which to take readings, and LLNL currently has in excess of 200 wells. For soil gas and vapor measurements in addition to groundwater such as is needed at Lawrence Livermore National Laboratory (LLNL) Site 300, there is an immediate need for deployable technologies for both site characterization and post-closure monitoring.

4.2.3 Objectives/Needs: Anticipated performance requirements for a full-scale demonstration include:

- Maximum outside sensor diameter of 4 inch (10.16 cm) to be deployable down-hole (i.e., fit inside a 4.5-inch (11.43-cm) diameter well or borehole) or be of appropriate size for near real-time readings with a push-technology (e.g., cone penetrometer).
- Capability to log measurements as frequent as weekly
- Duty cycle of at least 5 to 10 years, with maintenance no more than yearly.
- Ability to operate at typical depths of 0 to 30 feet (with a maximum depth of 100 feet) and temperatures of 68 to 86°F (20 to 30°C).
- Capability to measure percent moisture in the soil.
- Minimum resolution of 1000 pCi/L of soil moisture with a range of 1000 to 10 million (10^7) pCi/L. with an accuracy of $\pm$10%.
- Capability to interrogate a subsurface zone with dimensions vertically of up to 24 inches (60 cm) and radially up to 24 inches or more.

While the primary intent of this solicitation need is to fulfill the requirements of LLNL listed above, DOE is willing to entertain proposals that address the tritium monitoring needs in soil of other sites, such as NTS. NTS's requirements are identical to those of LLNL with the following exceptions:

- Minimum resolution of 100 pCi/L of soil moisture with a range of 100 to 1,000 pCi/L with an accuracy of $\pm$10%.
- Ability to operate at depths up to 400 ft (122 m) and 50 ft of head pressure.

Generally, the well locations at all interested DOE sites are remote with no conventional electricity available (requires battery or solar power -- or other alternatives where applicable). The technology must result in significant cost savings over baseline monitoring methods. Under the current DOE baseline method for soil gas/vapor measurements of tritium, large volumes of air/soil vapor must be pumped from boreholes to obtain sufficient quantities of water with tritium for analysis. Samples are then sent to an offsite laboratory with turnaround for analysis taking a minimum of 30 days. Ultimately, the technology must be acceptable to regulators and stakeholders.

4.2.4 Associated STCG Needs: NV01-0001-01S, OK99-21

4.2.5 EMSP Related Research: None on current list

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4.2.7 Special Requirements: It is anticipated that this development effort will initiate at Exploratory Development (Stage 3) or Advanced Development (Stage 4) level. It is requested that optional phase(s) will be included in proposals to extend development through Demonstration (Stage 6).

5. Nuclear Materials Focus Area

5.1.1 Nuclear Materials Focus Area Topic: Nuclear Isotopic Dilution of Highly Enriched Uranium by Dry Blending Process

5.1.2 Background: DOE has initiated numerous activities to focus on identifying material management strategies for disposition of excess fissile materials, for example the EM Integration/2006 Plan, Processing Needs Assessment Study, Nuclear Materials Integration Program, 97-1 ^{233}U Safe Storage Program, and others. To date, many of these planning strategies have included isotopic dilution of highly enriched uranium (HEU) as a means of reducing the proliferation and criticality safety risks. The HEU at the Idaho National Engineering and Environmental Laboratory (INEEL) is considered to be "off-spec" because of its ^{232}U and ^{236}U content. Decay of the ^{232}U produces a daughter product, ^{208}Tl, that emits high energy gamma radiation (2.8 MeV). In addition to the ^{232}U and ^{236}U contamination some of the HEU product is also contaminated with fission products which further complicates the radiation exposure issues for storage and off-site shipment.

The INEEL has about 1,700 Kg of off-spec HEU currently stored at INEEL in the CPP-651 vault facility. This is "excess" HEU material. It does not meet the Oak Ridge acceptance criteria, and has transportation issues related to shipping containers and external radiation fields. In its current state this material can not be removed from CPP- 651 for dispositioning. Removal of this material is the critical path item for achieving new or interim missions or closure of CPP-651. The dispositioning paths for this material include: (a) isotopically dilute to 0.9% ^{235}U enrichment for disposal in the High Level Waste (HLW) program, or (b) dilute to about 5% ^{235}U enrichment for potential beneficial reuse. Both disposition options require the HEU to be characterized and repackaged at the INEEL to permit transfer.

5.1.3 Objectives/Needs: The 1,700 Kg of off-spec HEU must be sampled, analyzed and repackaged to: (a) meet the receiver site processing criteria e,g., dissolver criticality safety limits at Savannah River Site (SRS), (b) utilize approved shipping containers (such as 6-M Drum) and (c) address related as low as reasonably achievable (ALARA) concerns for shipper and receiver. The utilization of the proposed dry milling and blending process is not intended to replace the final aqueous dissolution /dilution/extraction treatment step. Rather, it is intended to facilitate material transfer from CPP-651, maintain ALARA throughout the process, and help optimize the aqueous dilution/treatment system.

Technologies are required to rapidly grind and blend uranium oxides (U_3O_8, UO_3, UO_2) with different ^{235}U enrichments, different particle size distributions and different densities into a uniformly mixed oxide that prevents the separation and enrichment of the ^{235}U oxide. The objective is to continue the development of a non-aqueous technique to dilute the enrichment of ^{235}U to less than weapons grade concentrations while maintaining adequate contamination

control, ALARA and criticality safety. Once the proof of principle (irreversible mixing and blending) have been demonstrated with uranium oxide material (Natural Uranium (NU) and Depleted Uranium (DU) oxide), tests will be conducted to further optimize production parameters and improve design features related to container size, milling times, radiological contamination control, worker exposures, accountability, remote handling, packaging and control features and criticality safety.

Technologies are sought that can fulfill the following requirements:

- Blend like uranium oxides (UO_2 with UO_2, UO_3 with UO_3, and U_3O_8 with U_3O_8) with different particle sizes and ^{235}U enrichments and demonstrate:
  - (a) complete mixing, by sampling blended mixture and analyzing for ^{235}U enrichment,
  - (b) a reduced particle size distribution that prevents ^{235}U separation via physical techniques,
  - (c) adequate mixing that prevents separation of ^{235}U via chemical treatments of different uranium oxides.
- Blend two unlike uranium oxides (e.g.,UO_3 with U_3O_8), with different particle sizes and ^{235}U enrichments and demonstrate:
  - (a) complete mixing, by sampling blended mixture and analyzing for ^{235}U enrichment,
  - (b) a reduced particle size distribution that prevents ^{235}U separation via physical techniques,
  - (c) adequate mixing that prevents separation of ^{235}U via chemical treatments of different uranium oxides.
- Grind Light Water Breeder Reactor (LWBR) fuel pellets
  - (a) use material of similar size and hardness for feasibility tests.
  - (b) confirm feasibility with LWBR pellets (LWBR tests to be conducted at INEEL- with dry grinding/blending equipment)

5.1.4 Associated STCG Needs: ID-8.1.01

5.1.5 EMSP Related Research: None on current list

5.1.6 Point of Contact:

Nathan Chipman
Idaho National Engineering and Environmental Laboratory
208-526-1424
chipna@inel.gov

5.1.7 Special Requirements: It is anticipated that three phases might be appropriate for this development effort. The initial phase would include demonstrating ability to meet the performance criteria listed above. Subsequent optional phase(s) would include the optimization of the process addressing items such as blending parameters, remote handling, degree of mixing can deterioration and grinding media deterioration/contamination that results

from a typical blending operation, remote sampling, related contamination control features for packaging, blending, grinding media separation, and safety provisions and conceptual design for installation of dry grinding/blending equipment at INEEL.

5.2.1 Nuclear Materials Focus Area Topic: SNF Remote Moisture Monitor

5.2.2 Background: DOE EM spent nuclear fuels for the most part are to be packaged into dry, sealed, metal canisters for periods up to 30 years or more before being transferred to a federal repository. As most of these fuels have been stored under water, moisture detection during the interim storage period becomes extremely important in the projection of fuel/canister integrity.

5.2.3 Objectives/Needs: It is anticipated that advanced techniques to monitor moisture content within the sealed canisters will be needed to avoid opening the canisters prior to disposal. These techniques will be used to assess the performance of the fuel and canister and will be used to reliably predict moisture content within the canister under a variety of storage parameters.

5.2.4 Associated STCG Needs: ID-1.107, ID-1.2.04

5.2.5 EMSP Related Research: None on current list

5.2.6 Point of Contact:

Nathan Chipman
Idaho National Engineering and Environmental Laboratory
208-526-1424
chipna@inel.gov

5.3.1 Nuclear Materials Focus Area Topic: Spent Nuclear Fuel NDA/NDE and Monitoring Devices

5.3.2 Background: DOE EM spent nuclear fuels for the most part are to be packaged into dry, sealed, metal canisters for periods up to 30 years or more before being transferred to a federal repository. Container specific NDE monitoring techniques will be required to validate and verify storage parameters.

5.3.3 Objectives/Needs: It is anticipated that advance techniques to monitor storage conditions will be required to obtain real time data needed to assess the condition of the spent fuel and storage canister. Remote monitoring techniques for properties such as temperature, moisture, pressure, and perhaps microbiological species are needed prior to packaging closure. These techniques must avoid reopening a container sealed for repository disposal.

5.3.4 Associated STCG Needs: ID-1.1.02, ID-1.105, ID-1.1.09, ID-S.1.06, RL-SNF04

5.3.5 EMSP Related Research: None on current list

5.3.6 Point of Contact:

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chipna@inel.gov

5.4.1 Nuclear Materials Focus Area Topic: Standardized Spent Nuclear Fuel Packaging

5.4.2 Background: DOE Em spent nuclear fuels exist in a variety of physical sizes and cladding materials. In addition, post radiation examinations and extended wet storage periods have combined to give significant quantities of spent nuclear fuel that are degraded to varying degrees. A standardized canister design has been developed. However, many of the design requirements and details have yet to be established.

5.4.3 Objectives/Needs: The multi-site use of a standardized canister would greatly simplify handling tasks at a federal repository. Packaging components and internal basket designs are needed to handle the variety of anticipated fuels. Canister sealing welding techniques must be developed and verified. A final unit suitable for disposal is needed to reduce or eliminate the necessity of spent nuclear fuel being removed from the canister or reopening a sealed canister prior to repository disposal.

5.4.4 Associated STCG Needs: ID-1.1.08

5.4.5 EMSP Related Research: None on current list

5.4.6 Point of Contact:

Nathan Chipman
Idaho National Engineering and Environmental Laboratory
208-526-1424
chipna@inel.gov

Appendix 1
References

Tanks Focus Area

1. Brown, G. N., R. J. Elovich, and L. A. Bray. 1995. Evaluation and Comparison of SuperLig 644, Resorcinol-Formaldehyde and CS-100 Ion Exchange Materials for the Removal of Cesium from Simulated Alkaline Supernate. PNL-10486, Pacific Northwest Laboratory, Richland, Washington. (D1.1.1)

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5. Hubler, T. L., W. J. Shaw, G. N. Brown, J. C. Linehan, J. A. Franz, T. R. Hart, and M. O. Hogan. 1996. Chemical Derivation to Enhance the Chemical/Oxidative Stability of Resorcinol-Formaldehyde (R-F) Resin. PNNL-11327, Pacific Northwest National Laboratory, Richland, Washington. (D1.1.1)

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7. M. R. Smith.,et.al., “Laser Ablation -Inductively Coupled Plasma Mass Spectrometry: Analysis Of Hanford High-Level Waste Materials”, Science and Technology for Disposal of Radioactive Tank Wastes, Edited by W. W. Schulz and N. J. Lombardo, Plenum Press, New York, 1998 135. (D1.2.1)

8. Smith, M. R., et.al.,1996. Initial Report on the Application of Laser Ablation - Inductively Coupled Plasma Mass Spectrometry for the Analysis of Radioactive Hanford Tank Waste Materials. PNNL-11449, Pacific Northwest National Laboratory, Richland, Washington. (D1.2.1)

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10. http://www.pnl.gov/tfa/back/catgyref.stm - pretreatment (D1.1.1)

11. http://www.pnl.gov/tfa/back/catgyref.stm - characterization (D1.2.1)

12. Hanford Site: http://www.pnl.gov/tfa/sites/hanford/index.stm (D1.3.1)

13. Single shell tanks: http://www.pnl.gov/tfa/sites/hanford/singlece.stm (D1.3.1)

Transuranic and Mixed Waste Focus Area

TMFA Homepage: http://wastenot.inel.gov/mwfa

Deactivation and Decommissioning Focus Area

1. Bossart, S. J. and K. M. Kasper, Improved D&D Through Innovative Technology Deployment, RadWaste Magazine, Volume 5, Number 1, January, 1998. p. 10-18. (D3.1-3.10)

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6. Bossart, S.J., H. D. Shoemaker, and K. M. Kasper, Improved Technologies to Alleviate Worker Heat Stress, Spectrum 98 - International Conference on Decommissioning and Decontamination and on Nuclear and Hazardous Waste Management, American Nuclear Society, Denver, Colorado, September 13-18, 1998. (D3.6.1)

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8. Bossart, S.J., J.R. Duda, W. Lupichuk, Life After Large-Scale Technology Demonstrations, Paper presented at Waste Management '99, Tucson, Arizona, February 28-March 4, 1999. (D3.1-3.10)

9. Bossart, S.J. and J.R. Duda, Waste Minimization Technologies for D&D of Radioactively-Contaminated Facilities, 1999 U.S. Department of Energy Pollution Prevention Conference, Albuquerque, New Mexico, November 15-19, 1999. (D3.1-3.10)

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12. Bossart, S. J. and William Lupichuk, D&D Technology Deployment Through ASTD Projects, International Decommissioning Symposium 2000, Knoxville, Tennessee, June 12-16, 2000. (D3.1-3.10)

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14. Bossart, S. J. and R. Vagnetti, Where Can I Find Information About D&D Technologies?, Paper presented at Spectrum 2000, Chattanooga, Tennessee, September 24-28, 2000. (D3.1-3.10)

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16. FY 1999 Annual Report - Tomorrow's Technologies Today, Available through the D&D Focus Area, Morgantown, WV

17. D&D Focus Area FY 2000 Mid-Year Review, Vol. 1&2, March 28-30, 2000 Available through the D&D Focus Area, Morgantown, WV

18. D&D Focus Area Technical Response to FY 2000 Site Needs, March 2000, Available through the D&D Focus Area, Morgantown, WV

19. Long-Term Stewardship Study (Draft), October 2000, Document only available through the National Academy of Science

20. Martineit, R. A., T. D. Borgman, S. J. Bossart, D. M. Brown, D. R. Krause, M. S. Peters, P. J. Pettit, G. P. Ruesink, L. L. Stebbins, R. D. Warner, Large-Scale Decontamination and Decommissioning Technology Demonstration Project at a Former Uranium Metal Production Facility, Paper Presented at Waste Management 1997, Tucson, AZ, March 2-7, 1997. (3.1-3.10)

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27. Bossart, S.J. and K. M. Kasper, Innovative Technologies for Asbestos Removal, Treatment, and Recycle. August, 1997. Paper presented at Beneficial Reuse '97 Conference, Knoxville, Tennessee, August 5-7, 1997. (3.1, 3.7)

28. Bossart, S. J. and K. M. Kasper, The D&D Focus Area's Large-Scale Demonstration Program, Presented at the Emerging Technologies in Hazardous Waste Management IX, I&EC Special Symposium, American Chemical Society, Pittsburgh, Pennsylvania, September 15-17, 1997. (3.1-3.10)

29. Bossart, S. J. and K. M. Kasper, Improved D&D Through Innovative Technology Deployment, Presented at the American Nuclear Society's Topical Meeting on DD&R, Knoxville, Tennessee, September 7-12, 1997. (3.1-3.10)

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33. Bossart, S. J. And R. Vagnetti, The U.S. Department of Energy's Market for Deactivation and Decommissioning Services, American Nuclear Society Second Topical Meeting and Exhibition on Decomissioning, Decontamination, and Reutilization, Knoxville, Tennessee, September 12-16, 1999. (3.1-3.10)

34. Butler, C. R., K. M. Kasper, S. J. Bossart, Assessment of DOE Radioactive Scrap Metal Disposition Options, October, 1996. Paper presented at Beneficial Reuse '96 Conference, Knoxville, Tennessee, October 22-24, 1996. (3.1, 3.3, 3.4, 3.5, 3.7)

35. Bossart, S. J., Conner C., Jobson G, and Rosenberger S., Copper Cable Recycling System -Reuse of Copper from Decommissioning Projects, Paper presented at Spectrum 2000, Chattanooga, Tennessee, September 24-28, 2000. (3.1, 3.3, 3.4, 3.5, 3.7)

Subsurface Contaminants Focus Area

1. Tritium Focus Group (TFG) homepage: http://www.er.doe.gov/production/er-80/tfg/ (D4.1.1 and D4.2.1)

2. Nevada Test Site (NTS) Site Technology Coordination Group (STCG) Need Number: NV01—0001-01S (see DOE-Nevada homepage below)

3. Lawrence Livermore National Laboratory (LLNL) Site Technology Coordination Group (STCG) Need Number OK99-21 (see DOE Oakland homepage below)

4. Tritium Monitoring Technology Needs Update Meeting, October 25, 1999.

Related Web Sites:
DOE-Nevada homepage link to technology needs statements:
DOE-Oakland homepage link to technology needs statements for LLNL and other DOE-Oakland sites
DOE-Environmental Management homepage to link to all DOE sites and their technology needs statements
Tritium Focus Group (TFG)

Nuclear Materials Focus Area

NMFA Homepage: http://id.inel.gov/nmfa

NETL F 541.1-5#
(9/2000) OPI=PS10
(Previous Editions Obsolete)

J.3 - REPORTING REQUIREMENTS CHECKLIST

1. AWARDEE:

2. IDENTIFICATION NUMBER:

3. REPORT SUBMISSION ADDRESS: *The requested quantity of all required report deliverables shall be submitted to the following address:*

NETL AAD DOCUMENT CONTROL BLDG. 921
U.S. DEPARTMENT OF ENERGY
NATIONAL ENERGY TECHNOLOGY LABORATORY
P.O. BOX 10940
PITTSBURGH, PA 15236-0940

4. PLANNING AND REPORTING REQUIREMENTS:

	FORM NO.	FREQ.	NUMBER OF COPIES
A. GENERAL MANAGEMENT			
■ Management Plan	None	O,C	4
■ Status Report	None	M	4
□ Summary Report	1332.2		
B. SCHEDULE/LABOR/COST			
□ Milestone Schedule/Plan	1332.3		
□ Labor Plan	1332.4		
■ Cost Plan	1332.7	O,C,PY	3
□ Milestone Schedule/Status Report	1332.3		
□ Labor Management Report	1332.8		
■ Cost Management Report	1332.9		
		M	3
C. EXCEPTION			
□ Conference Record			
■ Hot Line Report	None		
■ Journal Articles/Conference	None	A	2
Papers and Proceedings	None	A	2
D. ENVIRONMENTAL			
■ Hazardous Substance Plan			
■ Hazardous Waste Report	None	O	3
□ Environmental Compliance Plan	None	FC	3
□ Environmental Monitoring Plan	None		
□ Environmental Status Report	None		
	None		

	FORM NO.	FREQ.	NUMBER OF COPIES
E. TECHNICAL (One paper copy and one PDF electronic file copy)			
□ Technical Progress Report	None		
■ Final Report			
■ Draft for Review	None	FD	2
■ Final for Approval	None	FC	2
■ Topical Report	None	A	2
F. PROPERTY			
□ Report of Contractor's Property Management System	None		
□ Annual Report of Property in the Custody of Contractors	F580.1-8		
□ High Risk Property Report	F580.1-25		
□ Report of Physical Inventory of Capital Equipment	None		
□ Report of Physical Inventory of Sensitive Items	None		
■ Report of Termination or Completion Inventory	SF-1428 and SF-120 and F580.1-7	FC	1
G. OTHER			
□ Key Personnel Staffing Report	None		
□ Subcontracting Report	SF-294		
□ Summary Subcontracting Report	SF-295		
□ Software	None		
■ Other ITSR		A	2

5. FREQUENCY CODES AND DUE DATES:

Definition	Calendar Days Due After Event
A - As Required (See attached text for applicability)	0
C - Contract Change	15
FC - Final - End of Effort	0
FD - Final Technical - Draft Version	- 60
M - Monthly	25

Definition	Calendar Days Due After Event
O - Once After Award	30
Q - Quarterly (End of Calendar Quarter)	30
S - Semiannual (End of project year and project half-year)	30
Y - Yearly (End of project year)	30
PY - Yearly plan for following federal fiscal year	-15

Property Reports
P - Property Management System - within 6 months of award date
YP - Yearly property - due 10/15 for period ending 9/30
I - Physical Inventory of Capital Equipment - Biennial from award start date

Other
SS - Subcontracting Report - Semi-annual due 4/30 and 10/30 for period ending 3/31 and 9/30 respectively
YS - Summary Subcontracting Report - Annually, due 10/30 for period ending 9/30

* The yearly plans, identified as required in Sections 4A and 4B, are due by September 15 for the following Federal fiscal year.

6. SPECIAL INSTRUCTIONS:

The forms identified in the checklist are available at http://www.netl.doe.gov/business/forms/forms.html. Alternate formats are acceptable provided the contents remain consistent with the form. All **technical reports** submitted to the DOE **must** be accompanied by a completed and signed NETL F 510.1-5, addressing patent information.

J.4 GENERAL INSTRUCTIONS FOR THE PREPARATION AND SUBMISSION OF REPORTS (MAR 1999)

The contractor shall prepare and submit (postage prepaid) the plans and reports indicated on the "Reporting Requirements Checklist" to the addressee identified on the checklist. The level of detail the contractor provides in the plans and reports shall be commensurate with the scope and complexity of the effort and shall be as delineated in the guidelines and instructions contained herein. The prime contractor shall be responsible for acquiring data from any subcontractors to ensure that data submitted are compatible with the data elements which prime contractors are required to submit to DOE.

J.5 MANAGEMENT PLAN (JAN 2000)

The Management Plan describes the contractor's approach to performing the effort and producing the products identified in the contractual agreement, and the technical, schedule, cost, and financial management control systems to be used to manage performance.

The outline for the Management Plan and a description of the contents follows:

EXECUTIVE SUMMARY

The executive summary gives DOE/NETL's management a brief, comprehensive overview of the most important aspects of the management plan.

BACKGROUND

This is a discussion of the background of the project, including the scientific, sociological, legislative, and historical factors, that demonstrates the contractor's understanding of the problems, both technical and management, associated with the project.

SCOPE OF THE PROJECT

This section gives a brief overview of the project. It should include:

general description of project objectives;
task titles and short descriptions;
participants.

WORK BREAKDOWN STRUCTURE (WBS)

The scope and complexity of the contractual agreement influence the number of levels required. Each descending level represents an increasingly detailed definition of the work elements. Level 1 is the goal or objective of the contractual agreement in its entirety. Level 2 consists of the major work products necessary for achieving the goals of the contractual agreement. Level 3 outlines the major element segments (subsystems) necessary for completing Level 2 elements. Work breakdown structure elements are identified by name and number from a progressive, alphanumeric system. For example:

Example:

WBS Level 1: The overview should describe the philosophy underlying the selected technical approach.

WBS Levels 2 and 3: _____

WBS ELEMENT X.X: _____(TITLE)

OBJECTIVE: State the objective of the task in a concise manner.

BACKGROUND **(Not required for Construction Tasks):**

With respect to the project objective, what is the current state of understanding?

Given the state-of-the-art, what are the outstanding issues which must be resolved in order to make progress?

TECHNICAL APPROACH **(Not required for Construction Tasks)**: Describe in detail the manner in which the various issues will be resolved. The following are aspects of the work which should be considered and addressed (along with others you feel appropriate):

What experiments will be performed and why?

What materials will be used?

What are the experimental conditions?

What analytical techniques will be employed?

What will be the approach to modeling?

In answering these questions, you should consider how the various tasks relate to one another and to other relevant ongoing work. Task outputs which feed into other tasks (and vice-versa) should be clearly delineated.

DELIVERABLES (**Not required for Construction Tasks)**: Describe specifically the results of the task. These should include:

raw and reduced data and method of presentation;

brief description of models to be developed;

other key results as appropriate.

SUPPORT SYSTEMS AND CONTROLS

In this section, the management, technical, and administrative system that will be used to control and execute the project will be described. Examples of the systems include: systems and engineering analysis, quality assurance, environmental, safety and health, legal support, ADP support, and accounting support.

J. 6 STATUS REPORT (MAR 1999)

The Status Report is the contractor's project manager brief narrative assessment (by WBS) of the work actually performed and the overall status of the various tasks.

The Status Report provides a concise narrative assessment of the status of the work being performed under the contractual agreement. DOE management uses the report to monitor status and to provide early recognition of potential problem areas. The report highlights changes to objectives, changes to technical approach, relationship to previously planned activities, task variances from baselines in excess of stipulated thresholds by WBS reporting element, causative

factors, and actions taken or proposed to resolve them, list of presentations and publications, as well as factors with potential for causing significant variances in the future. Task progress of major accomplishments for each task in bullet form may also be highlighted. The report identifies open items requiring action by DOE or the contractor. The report also provides a summary assessment of the current situation, including forecast of the near future and the expected impact on project accomplishment.

J.7 COST PLAN (DOE F 1332.7) (MAR 1999)

The Cost Plan establishes the plan for accruing total costs by WBS element for the life of the contractual agreement. The time-phased baseline establishes the basis for the measurement of actual cost accumulation and provides basic information for updating and forecasting budget requirements. The Cost Plan itemizes accrued costs by WBS element for prior fiscal years, the current fiscal year by month, and future fiscal years until completion of the contractual agreement. For projects being managed to the fourth WBS level, additional forms show cost detail for each task individually.

J.8 COST MANAGEMENT REPORT (DOE F 1332.9) (MAR 1999)

This is a periodic report that shows the cost status of the contract and is compared with the Cost Plan. Information is reported by WBS element.

J.9 HOT LINE REPORT (JAN 2000)

The "Hot Line" Report may be used to report a major breakthrough in research, development, or design; an event causing a significant schedule slippage or cost overrun; an environmental, safety and health violation; achievement of or failure to achieve an important technical objective; or any requirement for quickly documented direction or redirection. The report shall be submitted by the most rapid means available, usually electronic, and should confirm telephone conversations with DOE representatives. Identification as a "Hot Line Report" serves notice at each link in the delivery chain that expedition in handling is required. Unless otherwise agreed by the parties involved, DOE is expected to take action and respond in a similarly timely manner. The report should include:

1. Contractor's name and address;
2. Contract title and number;
3. Date;
4. Brief statement of problem or event;
5. Anticipated impacts; and
6. Corrective action taken or recommended.

Hot line reports shall document the incidents listed below:

1. Any single fatality or injuries requiring hospitalization of five or more individuals is to be immediately reported.

2. Any significant environmental permit violation is to be reported as soon as possible, but within 24 hours of the discovery of the incident.

3. Other incidents that have the potential for high visibility in the media are to be reported as quickly as possible, but within 24 hours following discovery.

4. Any failure resulting in damage to Government-owned equipment in excess of $50,000 is to be reported as quickly as possible, but within 24 hours of the discovery of the failure.

5. Any unplanned event which is anticipated to cause a schedule slippage or cost increase significant to the project is to be reported within 24 hours.

6. Any verbal or written Notice of Violation of any Environmental, Safety, and Health statutes arising from the performance of this contract is to be immediately reported.

7. Any accidental spill or release which is in violation of any Environmental, Safety, and Health statutes arising from the performance of this contract is to be immediately reported, but within 24 hours of the discovery of the accident.

8. Any incident which causes a significant process or hazard control system failure, or is indicative of one which may lead to any of the above defined incidents, is to be reported as soon as possible, but within 5 days of discovery.

The requirement to submit Hot Line Reports for the incidents identified in 1, 2, 3, 6, or 7 is for the sole purpose of enabling DOE officials to respond to questions relating to such events from the media and other public.

When an incident is reported in accordance with 4, 5, 6, 7, or 8, the contractor shall conduct an investigation of its cause and make an assessment of the adequacy of resultant action. A written report is required no later than ten (10) calendar days following the incident and shall include an analysis of the pertinent facts regarding the cause, and a schedule of the remedial events and time periods necessary to correct the action.

When an event results in the need to issue a written or verbal statement to the local media, the statement is to be cleared first; if possible, and coordinated with NETL Management and Communications Division, the Contracting Officer Representative (COR) and the Contracting Officer.

J.10 JOURNAL ARTICLES, CONFERENCE PAPERS AND PROCEEDINGS GENERATED BY LARGE BUSINESSES FOR DOE REVIEW (SEPT 2000)

The Contractor shall submit to DOE for review and approval all documents generated by the Contractor, or any subcontractor, which communicate the results of scientific or technical work supported by DOE under this award, whether or not specifically identified in the award, prior to submission for publication, announcement, or presentation. Such documents include journal articles, conference papers and proceedings, etc. Each such document shall be accompanied by a properly completed NETL Form 510.1-5, "Request for Patent Clearance for Release of Contracted Research Documents."

The Contractor shall simultaneously submit a draft version of the document to the DOE COR and the DOE Patent Counsel Office prior to the publication, presentation, or announcement. The document submitted to the DOE Patent Counsel shall be accompanied by a completed NETL Form 510.1-5. The DOE COR and DOE Patent Counsel shall review the draft version of the document and notify the Contractor of approval or recommended changes. The approved final version shall be submitted to the NETL AAD Document Control Coordinator.

The following information shall be provided for conference papers and proceedings, etc.

-- Name of conference
-- Location of conference (city, state, and country)
-- Date of conference (month/day/year)
-- Conference sponsor

J.11 JOURNAL ARTICLES, CONFERENCE PAPERS AND PROCEEDINGS GENERATED BY A SMALL BUSINESS OR NONPROFIT ORGANIZATION FOR DOE REVIEW (SEPT 2000)

The Contractor shall submit to DOE for review and approval all documents generated by the Contractor, or any subcontractor, which communicate the results of scientific or technical work supported by DOE under this award, whether or not specifically identified in the award, prior to submission for publication, announcement, or presentation. Such documents include journal articles, conference papers and proceedings, etc. Each such document shall be

accompanied by a properly completed NETL Form 510.1-5, "Request for Patent Clearance for Release of Contracted Research Documents."

The Contractor shall submit a draft version of the document to the COR prior to the publication, presentation, or announcement. The COR shall review the draft version of the document and notify the Contractor of approval or recommended changes. The final version, along with a completed NETL Form 510.1-5, shall be submitted to the NETL AAD Document Control Coordinator.

The following information shall be provided for conference papers and proceedings, etc.

-- Name of conference
-- Location of conference (city, state, and country)
-- Date of conference (month/day/year)
-- Conference sponsor

J.12 JOURNAL ARTICLES, CONFERENCE PAPERS AND PROCEEDINGS GENERATED BY A UNIVERSITY FOR DOE REVIEW (SEPT 2000)

The Contractor shall submit to DOE for review and comment all documents generated by the Contractor, or any subcontractor, which communicate the results of scientific or technical work supported by DOE under this award, whether or not specifically identified in the award, prior to submission for publication, announcement, or presentation. Such documents include journal articles, conference papers and proceedings, etc. Each such document shall be accompanied by a properly completed NETL Form 510.1-5, "Request for Patent Clearance for Release of Contracted Research Documents."

The Contractor shall submit a draft version of the document to the COR prior to the publication, presentation, or announcement. The COR shall review the draft version of the document and notify the Contractor of recommended changes. The final version, along with a completed NETL Form 510.1-5, shall be submitted to the NETL AAD Document Control Coordinator.

The following information shall be provided for conference papers and proceedings, etc.

-- Name of conference
-- Location of conference (city, state, and country)
-- Date of conference (month/day/year)
-- Conference sponsor

J.13 ENVIRONMENTAL (OCT 2000)

In response, in part, to the requirements of the National Environmental Policy Act of 1969 (NEPA) and other related environmental statutes, the National Energy Technology Laboratory (NETL) requires the submission of various documents that assess the environmental aspects and projected impacts of all of its proposed actions. These documents may include the following: (1) Hazardous Substance Plan; (2) Hazardous Waste Report; (3) Environmental Compliance Plan; (4) Environmental Monitoring Plan; and (5) Environmental Status Reports.

The environmental information provided in these documents will enable NETL to fulfill its responsibilities under NEPA (additional information about the requirements of the National Environmental Policy Act can be found in the DOE NEPA Compliance Guide and 40 CFR 1021) and to monitor the proposer's compliance with other environmental regulations. The implementation of any task associated with a proposed action will be dependent upon DOE submitting and acquiring approval of necessary NEPA documentation. Therefore, to minimize the risk of project delays, it is imperative that these reports be submitted in a timely manner.

The information contained herein specifies the basic environmental requirements for this procurement action, but it is not to be interpreted as containing all necessary information for any given project. Likewise, certain aspects of the requirements may not be applicable. Accordingly, the level of information provided should be sufficient for DOE to assess the environmental implications of the proposed action.

J.14 HAZARDOUS SUBSTANCE PLAN (MAR 1999)

The Contractor shall submit a Hazardous Substance Plan not later than thirty (30) days after initial contract award. The Plan shall specifically identify each Hazardous Substance (as defined under 40 CFR 261, Subpart D, entitled Lists of Hazardous Wastes) anticipated to be purchased, utilized or generated in the performance of this contract. For each such Hazardous Substance identified, the Plan shall specifically provide the following information:

Description of Substance/Chemical
EPA Hazardous Waste Number
EPA Hazard Code
Anticipated Quantity to be purchased, utilized or generated
Anticipated Hazardous Waste Transporter
Anticipated Hazardous Waste Disposal Facility Contractor and Location (City/Municipality, State)
Anticipated Treatment Method

J.15 HAZARDOUS WASTE REPORT (MAR 1999)

The Contractor shall submit a Hazardous Waste Report at the completion of contract performance. The Report shall specifically identify each Hazardous Waste (as defined under 40 CFR 261, Subpart D, entitled Lists of Hazardous Wastes) actually utilized, or generated in the performance of this contract. For each such Hazardous Waste identified, the Report shall specifically provide the following information:

Description of Substance/Chemical
EPA Hazardous Waste Number
EPA Hazard Code
Actual Quantity Disposed
Actual Hazardous Waste Transporter
Actual Hazardous Waste Disposal Facility Contractor and Location (City/Municipality, State)
Actual Disposal Date
Actual Treatment Method

The Hazardous Waste Report is intended as a final reconciliation of anticipated versus actual Hazardous Substances purchased, utilized, or generated in the performance of this contract.

J.16 TECHNICAL REPORTS (SEPT 2000)

CAUTION: Technical reports SHALL NOT include Limited Rights Data (such as restricted, proprietary or business sensitive information). Limited Rights Data shall be submitted in a separate appendix to the technical report. This appendix SHALL NOT be submitted in an electronic format but rather submitted in ONE ORIGINAL AND THREE (3) PAPER COPIES along with the paper version of the sanitized technical report deliverable. The appendix shall be referenced in, but not incorporated into , the sanitized technical report deliverable under the contract. In accordance with FAR 52.227-14, Rights in Data-General, the appendix must be appropriately marked and identified.

Further, if this award authorizes the awardee under the provisions of The Energy Policy Act of 1992 to request protection from public disclosure for a limited period of time of certain information developed under this award, technical reports SHALL NOT contain such Protected EPAct Information. Such information shall be submitted in a separate appendix to the technical report that is suitable for release after the agreed upon period of protection from public disclosure has expired. The appendix shall be referenced in, but not incorporated into , the sanitized technical

report deliverable under the contract. In accordance with the clause titled "Obligations as to Protected Energy Policy Act (EPAct) Information," the appendix must be appropriately marked and identified.

All TECHNICAL REPORTS submitted to the DOE MUST be accompanied by a completed and signed NETL F 510.1-5, addressing potentially patentable information.

J.17 FINAL TECHNICAL REPORT (MAR 1999)

The Final Report shall document and summarize all work performed during the contract period in a comprehensive manner. It shall also present findings and/or conclusions produced as a consequence of this work. This report shall not merely be a compilation of information contained in subsequent quarterly, or other technical reports, but shall present that information in an integrated fashion, and shall be augmented with findings and conclusions drawn from the research as a whole.

The contractor shall deliver a draft copy of the final report sixty (60) days before the completion of the period of performance. The Government shall be allowed thirty (30) days to review the draft copy and to notify the contractor, in writing, of approval or recommended changes. If the Government does not approve or recommend changes within thirty (30) days of receipt of the draft copy, the report shall be deemed approved. The approved final report is due on the contract completion date.

J.18 TOPICAL REPORT (MAR 1999)

These reports usually provide a comprehensive statement of the technical results of the work performed for a specific task or subtask of the Statement of Work (SOW), or detail significant new scientific or technical advances. If required, DOE shall review and approve the report outline prior to submission of the report.

J.19 GUIDELINES FOR ORGANIZATION OF TECHNICAL REPORTS (DEC 1999)

The following sections should be included (as appropriate) in technical reports in the sequence shown. Any section denoted by an asterisk is required in all technical reports.

TITLE PAGE* - The Title Page of the report itself must contain the following information in the following sequence:

Report Title
Type of Report (Quarterly, Semi-Annual, Annual, Topical, Final)
Reporting Period Start Date
Reporting Period End Date
Principal Author(s)
Date Report was Issued (Month [spelled out] and Year [4 digits])
DOE Award Number (e.g., DE-AC26-99NT12345) and if appropriate, task number
Name and Address of Submitting Organization (This section should also contain the name and address of significant contractors or subcontractors who participated in the production of the report.)

DISCLAIMER* -- The Disclaimer must follow the title page, and must contain the following paragraph:

"This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by

the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof."

ABSTRACT* - should be a brief, concise summary of the report.

TABLE OF CONTENTS*

LIST(S) OF GRAPHICAL MATERIALS

INTRODUCTION

EXECUTIVE SUMMARY - this should be a well organized summary that highlights the important accomplishments of the research during the reporting period. It should be no less than one page and no more than two pages in length, and should be single spaced. This summary must be more comprehensive than the traditional "abstract."

EXPERIMENTAL* - this should describe, or reference all experimental methods being used for the research. It should also provide detail about materials and equipment being used. Standard methods can be referenced to the appropriate literature, where details can be obtained. Equipment should be described only if it is not standard, or if information is not available thru the literature or other reference publications.

RESULTS AND DISCUSSION* - It is extremely important that this section includes enough relevant data, especially statistical data, to allow the project manager to justify the conclusions. With the relevant data, explain how the data was interpreted and how it relates to the original purpose of the research. Be concise in the discussion on how this research effort solved or contributed to solving the original problem.

CONCLUSION* - The conclusion should not simply reiterate what was already included in the "Results and Discussion" section. It should, however, summarize what has already been presented, and include any logical implications of how the successes are relevant to technology development in the future. This is extremely important, since "relevancy" continues to be a criteria of the program.

REFERENCES*
BIBLIOGRAPHY
LIST OF ACRONYMS AND ABBREVIATIONS
APPENDICES (IF NECESSARY)

Company Names and Logos -- Except as indicated above, company names, logos, or similar material should not be incorporated into reports.

Copyrighted Material -- Copyrighted material should not be submitted as part of a report unless written authorization to use such material is received from the copyright owner and is submitted to DOE with the report.

Measurement Units -- All reports to be delivered under this instrument shall use the SI Metric System of Units as the primary units of measure. When reporting units in all reports, primary SI units shall be followed by their U.S. Customary Equivalents in parentheses ( ).

The contractor shall insert the text of this clause, including this paragraph, in all subcontracts under this award.

Note: SI is an abbreviation for "Le Systeme International d'Unites."

J.20 ELECTRONIC MEDIA STANDARD FOR PREPARATION OF TECHNICAL REPORTS (DEC 1999)

FILE FORMAT

Production of high-quality, electronic documents is dependent on the quality of the input that is provided. Thus, the contractor shall submit one good quality paper copy using either permanent or alkaline paper plus an electronic version of each technical report.

ELECTRONIC REPORTS SHALL BE SUBMITTED IN THE ADOBE ACROBAT PORTABLE DOCUMENT FORMAT (PDF). ELECTRONIC REPORTS SUBMITTED IN A FORMAT OTHER THAN ADOBE WILL BE RETURNED AND THE REPORT CONSIDERED DELINQUENT.

Each report shall be an integrated file that contains all text, tables, diagrams, photographs, schematics, graphs, and charts.

SUBMISSION FORMAT

The electronic file(s) shall be submitted via diskette or CD-ROM. Diskettes or CD-ROMs must be labeled as follows:

DOE Award Number
Type/Frequency of Report(s)
Reporting Period (if applicable)
Name of submitting organization
Name, phone number and fax number of preparer

Diskettes -- Diskettes must be 3.5" double-sided, high-density (1.4 M Byte capacity). If file compression software is used to transmit a PDF file spanning more than one diskette, PKZIP from PKWare, Inc., is the required compression software. State the number of diskettes in the set (e.g., 1/3)

CD-ROM -- The electronic file(s) may be submitted on an ISO9660-format CD-ROM.

FILE NAMING

In naming the electronic file, the contractor shall use the standard eight-character naming convention for the main file name, and the three character extension applicable to the software use, e.g., .pdf for Adobe.

For the main file name, the first five characters are the last five digits from the award number; e.g., for Award Number DE-AC26-97NT12345, the first five characters are 12345.

The next character represents the technical report and will always be designated as “R”.

The remaining two characters indicate the chronological number of the particular type of report; e.g., Quarterly Technical Progress Reports for a 5-year award are numbered R01 through R20. Thus, the main file name for the sixth Quarterly Technical Progress Report under Award No. DE-AC26-99NT12345 would be 12345R06.PDF. If monthly, quarterly, annual, and a final technical report are required, the numbers would run from R01 through R86 (60 monthly reports, 20 quarterly reports, 5 annual reports, and 1 final report).

J.21 PROPERTY REPORTS (JAN 2000)

The NETL Property Handbook entitled "Management of Government Property in the Possession of Contractors," contains forms, instructions, and suggested formats for submission of property reports. This handbook can be found at http://www.netl.doe.gov/business/index.html.

J.22 REPORT OF TERMINATION OR COMPLETION INVENTORY (SF-1428 AND SF-120) (MAR 1999)

This report submitted on the SF-1428 and SF-120 is due immediately upon completion or termination of the contract. The contractor is required to perform and cause each subcontractor to perform a physical inventory, adequate for disposal purposes, of all Government property applicable to the contract.

J.23 ITSR Report

Innovative Technology Summary Reports (ITSRs) provide a means for technology developers to summarize their technologies, potential applications, cost and performance data, and other pertinent information concisely and consistently (typically in 15 pages or less). An ITSR documents technology demonstration(s) and serves as a source for marketing information for technical and nontechnical audiences. A principal goal of the ITSR is to help site decision makers judge the innovative technology's potential for implementation at their sites. As a technology summary, it presents information on the key characteristics, cost, and performance of the innovative technology in comparison with the baseline and other competing technologies. It also provides information on commercial availability, technology readiness for implementation, and how a specific technology performed under defined operating parameters in demonstration(s). The ITSR clearly presents the range of problems that the innovative technology can address and its advantages to the DOE cleanup in terms of system performance, cost, site closure schedule, and cleanup effectiveness. All ITSRs published by the Office of Science and Technology (OST) are available on OST's web site at http://ost.em.doe.gov under PUBLICATIONS. Guidance on the preparation of ITSRs is also available at this site under GUIDANCE. See “Preparation Guidance for Innovative Technology Summary Reports” for the format.

PART III, SECTION J. , ATTACHMENT C -- List of Government Property/Contractor Acquired

To be determined.

PART III, SECTION J. , ATTACHMENT D -- List of Government Property/Government Furnished

To be determined.

PART III, SECTION J. , ATTACHMENT E- - Small Business Subcontracting Plan (NOV 2000)

In accordance with FAR 52.219-9 and DEAR 952.226-72, the offeror, upon request by the Contracting Officer, shall submit and negotiate a subcontracting plan, where applicable, that separately addresses subcontracting with small business, veteran-owned small business, HUBZone small business concerns, small disadvantaged business, and women-owned small business concerns.

A sample small business subcontracting plan can be found on the NETL Website at: http://www.netl.doe.gov/business/forms/forms.html.

PART III, SECTION J., ATTACHMENT F - Stage and Gate Definitions

Reference: "Tracking Technology Maturity in DOE's Environmental Management Science and Technology Program" which can be viewed on the NETL solicitation page under the solicitation announcement.

The OST Technology Decision Process represents a series of stages and gates, from basic research through implementation. The scope of the process emphasizes all activities from basic research through, and including, the actions required for implementation/use of a technology or a technological system that meet a defined performance requirement or that address a clearly defined set of problems. The OST Technology Decision Process Gate Requirements and Deliverables,"Tracking Technology Maturity in DOE's Environmental Management Science and Technology Program" provides specific informational requirements that must be addressed for a technology to pass through a gate. The intent of the process is to (1) facilitate the collection of information; (2) specify the standard format for information; and (3) facilitate sound and timely decision-making based upon three major actions: GO forward, HOLD for specific action, or STOP do not proceed. The FA/CC/IP will use this document to perform a review of every technology as it passes through a gate. At Gate 4, the information will be submitted to the review group as defined herein. The requirements and deliverables matrix (Tables 1-4 of "Tracking Technology Maturity in DOE's Environmental Management Science and Technology Program." outlines the requirements at each gate. Technologies developed in the private sector and brought into the DOE-EM system for consideration of research, development, or implementation must be subjected to the stage/gate criteria by the FA. Consideration for a commercial-scale demonstration to obtain performance and cost-of-performance data on a real-world environmental management problem may be appropriate.

Stage 1: Basic Research
This stage represents fundamental scientific research for building and documenting core knowledge not tied to a specific, defined need. It includes basic laboratory experimentation, development of theory and analytical models, and proof of principle.

> Gate 1: Entrance into Applied Research Stage Research/studies addressing environmental performance needs. TD/PI addresses programmatic driver criteria (technology end user need, technical merit, costs, and safety/health/environmental protection/risk).

Stage 2: Applied Research
At this stage, directed scientific/engineering research is conducted that has a link to environmental management needs. Included are proof of principle and laboratory-scale experimentation.

> Gate 2: Entrance into Exploratory Development Stage
> Linked with clearly defined DOE-EM priority performance needs and satisfies experimental design criteria. TD/PI initiates baseline comparison and addresses gate programmatic driver criteria (technology end user need, technical merit, costs, safety/health/environmental protection/risk, stakeholder/regulator/tribal, and commercial viability).

Stage 3: Exploratory Development
In this stage, technical feasibility in terms of potential applications is evaluated (i.e., can the technology be sufficiently developed to solve the problem). Included are laboratory-scale prototyping, analysis of user needs, estimates of life-cycle costs, and identification of functional performance requirements and operational concepts.

> Gate 3: Entrance into Advanced Development Stage
> This gate is linked with clearly defined DOE-EM/private sector priority performance needs. TD/PI continues baseline comparison. TD/PI addresses gate programmatic driver criteria (technology end user need, technical merit, costs, safety/health/environmental protection/risk, stakeholder/regulator/tribal, and commercial viability).

Stage 4: Advanced Development
In this stage, proof of design is required. This includes full-scale laboratory testing, preliminary field testing, technical specification development, and infrastructure development plans. Stage Goal: Specific DOE-EM application of product, concept, or subsystems that includes studies, advanced analysis, and laboratory-scale models.

Gate 4: Entrance into the Engineering Development Stage (major decision point; includes review group interaction) The group completes review of information supplied by FA/CC/IP, TD/PI, and others. Technology is assessed as being the right technology, at the right place, at the right time. TD/PI addresses gate programmatic driver criteria (technology end user need, technology merit, costs, safety/health/environmental protection/risk, stakeholder/regulator/tribal, and commercial viability).

Stage 5: Engineering Development
This stage includes systematic use of the knowledge gained from research and development to develop a detailed approach for full-scale design. Components include documentation such as drawings, schematics, and computer codes; construction and demonstration units; prototypes and pilot-scale systems; system evaluation; reliability testing; infrastructure plans; and procurement specifications.

Gate 5: Entrance into the Demonstration Stage
The DOE-EM deployment schedule is established. Preliminary tests results are completed and documented. This stage satisfies test plan requirements. An Innovative Technology Summary Report referenced herein is issued unless a full-scale demonstration is to be performed in Stage 6. TD/PI addresses gate programmatic driver criteria (technology end user need, technology merit, costs, safety/health/environmental protection/risk, stakeholder/regulator/tribal, and commercial viability).

Stage 6: Demonstration
At this stage, the product or technology is subjected to a "real world" demonstration, either at a DOE site or at another location, using actual or simulated waste streams and/or anticipated operating conditions to verify assumptions made to this point. Stage Goal: Verification of design through test and evaluation of full-scale system. Objectives: System suitability, full-scale testing, system testing and market conditioning. Measures of Effectiveness: End user accepts the technology and programmatic driver criteria (technology end user need, technology merit, costs, safety/health/environmental protection/risk, stakeholder/ regulator/tribal, and commercial viability) are met.

Gate 6: Entrance into the Implementation Stage
Results of technology/system test is fully documented and a final Innovative Technology Summary Report is issued. A Cost and Performance Report for environmental remedial projects shall also be prepared at this gate for EM-40-funded technologies. The technology partner is fully invested (i.e., procurement path defined). Implementation and commercialization viability have been clearly defined according to accepted business standards. Gate programmatic driver criteria have been fully engaged (technology end user need, technology merit, costs, safety/health/environmental protection/risk, stakeholder/ regulator/tribal, and commercial viability).

Stage 7: Implementation
The product or technology has been proven to be viable, cost-effective, and applicable to required needs and is put into service by the end user. The technology must be available for transfer to the private sector or already commercially available for commercial use.

PART III, SECTION J., ATTACHMENT G - Supplemental Information Form

The following information shall be provided and included as the front page of Proposal Volume I, Offer and Other Documents

Proposal No.:	Leave Blank
Focus Area Topic Being Proposed Under:	
Project Description:	
Proposing Company Name:	
Address:	
Proposal Signatory:	
Title/Position:	
Telephone Number of Signatory:	
Principal Investigator:	
Address:	
Telephone Number:	
Business Type:	
Parent Company:	
Address:	
Telephone Number:	
Subsidiary Companies:	
Address	
Telephone Number:	
Participating Companies:	
Address:	
Telephone Number:	

Stage (Choose 1)

2	3	4	5	6	7

Is the proposed work a continuation of work previously sponsored by DOE:	Yes No (Circle one)

Estimated Project Schedule

Phase	Stage	Proposed Site	Start Date (Mo/Yr.)	End Date (Mo/Yr.)
Base Phase				
Phase 1				
Phase 2				
Phase 3				
Phase 4 etc.				

Estimated Project Cost

Phase	Proposed DOE Funding	Proposed Cost Share	Total Estimted Cost
Base Phase			
Phase 1			
Phase 2			
Phase 3			
Phase 4 etc.			
Total Project			

PART III, SECTION J., ATTACHMENT H --Acronyms List

AAD - (NETL) Acquisition and Assistance Division
ACO - Administrative Contracting Officer
ADPE - Automated Data Processing Equipment
ALARA - As Low As Reasonably Achievable
ASTD - Accelerated Site Technology Demonstration
CFR - Code of Federal Regulations
CX - Categorical Exclusion
DDFA - Deactivation and Decommissioning Focus Area
DOE - Department of Energy
dpm - disintegrations per minute
ECAM - Environmental Continuous Air Monitor
EIS - Environmental Impact Statement
EM - Environmental Management
EMSP - Environmental Management Science Program
EPAct - Energy Policy Act
FFRDC - Federally Funded Research and Development Centers
HEPA - High Efficiency Particulate Air
HEU - Highly Enriched Uranium
HLW - High Level Waste
ICP - Inductively Coupled Plasma
INEEL - Idaho National Engineering and Environmental Laboratory
ITSR - Innovative Technology Summary Report
LLNL - Lawrence Livermore National Laboratory
LLW - Low Level Waste
LOD - Limits of Detection
LWBR - Light Water Breeder Reactor
NDA - Non-Destructive Assay
NDE - Non-Destructive Evaluation
NETL - National Energy Technology Laboratory
NMFA - Nuclear Materials Focus Area
NTS - Nevada Test Site
NUREG - NUclear REGulation
OST - Office of Science and Technology
PCB - Poly-Chlorinated Biphenyl
pCi - picoCurie
PNNL - Pacific Northwest National Laboratory
PPE - Personal Protective Equipment

PRDA - Program Research and Development Announcement
psig - Pounds per Square Inch Gauge
RCRA - Resource Conservation and Recovery Act
RFP - Request For Proposals
SCFA - Subsurface Contaminants Focus Area
SOW - Statement of Work
SMT - Stable Metal Tritides
SNF - Spent Nuclear Fuel
SRS - Savannah River Site
STCG - Site Technology Coordination Group
STP - Stable Tritiated Particulates
TFA - Tanks Focus Area
TFG - Tritium Focus Group
TMFA - Transuranic and Mixed Waste Focus Area
TRU - transuranic
TRUPACT-II - TRansUranic PACkaging Transporter, model II
TSCA - Toxic Substance Control Act
WHC - Westinghouse Hanford Corporation
WIPP - Waste Isolation Pilot Plant

SECTION K - REPRESENTATIONS, CERTIFICATIONS, AND OTHER STATEMENTS OF OFFERORS OR QUOTERS

K.1 52.203-11 CERTIFICATION AND DISCLOSURE REGARDING PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS. (APR 1991)

(a) The definitions and prohibitions contained in the clause, at FAR 52.203-12, Limitation on Payments to Influence Certain Federal Transactions, included in this solicitation, are hereby incorporated by reference in paragraph (b) of this certification.

(b) The offeror, by signing its offer, hereby certifies to the best of his or her knowledge and belief that on or after December 23, 1989 -

(1) No Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress on his or her behalf in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment or modification of any Federal contract, grant, loan, or cooperative agreement;

(2) If any funds other than Federal appropriated funds (including profit or fee received under a covered Federal transaction) have been paid, or will be paid, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress on his or her behalf in connection with this solicitation, the offeror shall complete and submit, with its offer, OMB standard form LLL, Disclosure of Lobbying Activities, to the Contracting Officer; and

(3) He or she will include the language of this certification in all subcontract awards at any tier and require that all recipients of subcontract awards in excess of $100,000 shall certify and disclose accordingly.

(c) Submission of this certification and disclosure is a prerequisite for making or entering into this contract imposed by section 1352, title 31, United States Code. Any person who makes an expenditure prohibited under this provision or who fails to file or amend the disclosure form to be filed or amended by this provision, shall be subject to a civil penalty of not less than $10,000, and not more than $100,000, for each such failure.

K.2 52.204-3 TAXPAYER IDENTIFICATION. (OCT 1998)

(a) Definitions.

"Common parent," as used in this provision, means that corporate entity that owns or controls an affiliated group of corporations that files its Federal income tax returns on a consolidated basis, and of which the offeror is a member.

"Taxpayer Identification Number (TIN)," as used in this provision, means the number required by the Internal Revenue Service (IRS) to be used by the offeror in reporting income tax and other returns. The TIN may be either a Social Security Number or an Employer Identification Number.

(b) All offerors must submit the information required in paragraphs (d) through (f) of this provision to comply with debt collection requirements of 31 U.S.C. 7701(c) and 3325(d), reporting requirements of 26 U.S.C. 6041, 6041A, and 6050M, and implementing regulations issued by the IRS. If the resulting contract is subject to the payment reporting requirements described in Federal Acquisition Regulation (FAR) 4.904, the failure or refusal by the offeror to furnish the information may result in a 31 percent reduction of payments otherwise due under the contract.

(c) The TIN may be used by the Government to collect and report on any delinquent amounts arising out of the offeror's relationship with the Government (31 U.S.C. 7701(c)(3)). If the resulting contract is subject to the payment reporting requirements described in FAR 4.904, the TIN provided hereunder may be matched with IRS records to verify the accuracy of the offeror's TIN.

(d) Taxpayer Identification Number (TIN).

[ ] TIN: _____

[ ] TIN has been applied for.

[ ] TIN is not required because:

[ ] Offeror is a nonresident alien, foreign corporation, or foreign partnership that does not have income effectively connected with the conduct of a trade or business in the United States and does not have an office or place of business or a fiscal paying agent in the United States;

[ ] Offeror is an agency or instrumentality of a foreign government;

[ ] Offeror is an agency or instrumentality of the Federal Government.

(e) Type of organization.

[ ] Sole proprietorship;

[ ] Partnership;

[ ] Corporate entity (not tax-exempt);

[ ] Corporate entity (tax-exempt);

[ ] Government entity (Federal, State, or local);

[ ] Foreign government;

[ ] International organization per 26 CFR 1.6049-4;

[ ] Other _____

(f) Common parent.

[ ] Offeror is not owned or controlled by a common parent as defined in paragraph (a) of this provision.

[ ] Name and TIN of common parent:

Name _____

TIN _____

K.3 52.204-5 WOMEN-OWNED BUSINESS (OTHER THAN SMALL BUSINESS). (MAY 1999)

(a) Definition. Women-owned business concern, as used in this provision, means a concern that is at least 51 percent owned by one or more women; or in the case of any publicly owned business, at least 51 percent of its stock is owned by one or more women; and whose management and daily business operations are controlled by one or more women.

(b) *Representation*. [*Complete only if the offeror is a women-owned business concern and has not represented itself as a small business concern in paragraph (b)(1) of FAR 52.219-1, Small Business Program Representations, of this solicitation*.] The offeror represents that it [ ] is a women-owned business concern.

K.4 52.209-5 CERTIFICATION REGARDING DEBARMENT, SUSPENSION, PROPOSED DEBARMENT, AND OTHER RESPONSIBILITY MATTERS. (MAR 1996)

(a)(1) The Offeror certifies, to the best of its knowledge and belief, that -

(i) The Offeror and/or any of its Principals -

(A) Are [ ] are not [ ] presently debarred, suspended, proposed for debarment, or declared ineligible for the award of contracts by any Federal agency;

(B) Have [ ] have not [ ], within a three-year period preceding this offer, been convicted of or had a civil judgment rendered against them for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, state, or local) contract or subcontract; violation of Federal or state antitrust statutes relating to the submission of offers; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, tax evasion, or receiving stolen property; and

(C) Are [ ] are not [ ] presently indicted for, or otherwise criminally or civilly charged by a governmental entity with, commission of any of the offenses enumerated in subdivision (a)(1)(i)(B) of this provision.

(ii) The Offeror has [ ] has not [ ], within a three-year period preceding this offer, had one or more contracts terminated for default by any Federal agency.

(2) "Principals," for the purposes of this certification, means officers; directors; owners; partners; and, persons having primary management or supervisory responsibilities within a business entity (e.g., general manager; plant manager; head of a subsidiary, division, or business segment, and similar positions).

This Certification Concerns a Matter Within the Jurisdiction of an Agency of the United States and the Making of a False, Fictitious, or Fraudulent Certification May Render the Maker Subject to Prosecution Under Section 1001, Title 18, United States Code.

(b) The Offeror shall provide immediate written notice to the Contracting Officer if, at any time prior to contract award, the Offeror learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

(c) A certification that any of the items in paragraph (a) of this provision exists will not necessarily result in withholding of an award under this solicitation. However, the certification will be considered in connection with a determination of the Offeror’s responsibility. Failure of the Offeror to furnish a certification or provide such additional information as requested by the Contracting Officer may render the Offeror nonresponsible.

(d) Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by paragraph (a) of this provision. The knowledge and information of an Offeror is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

(e) The certification in paragraph (a) of this provision is a material representation of fact upon which reliance was placed when making award. If it is later determined that the Offeror knowingly rendered an erroneous certification, in addition to other remedies available to the Government, the Contracting Officer may terminate the contract resulting from this solicitation for default.

K.5 52.215-6 PLACE OF PERFORMANCE. (OCT 1997)

(a) The offeror or respondent, in the performance of any contract resulting from this solicitation, ___ intends, ___ does not intend (check applicable block) to use one or more plants or facilities located at a different address from the address of the offeror or respondent as indicated in this proposal or response to request for information.

(b) If the offeror or respondent checks "intends" in paragraph (a) of this provision, it shall insert in the following spaces the required information:

PLACE OF PERFORMANCE (STREET ADDRESS, CITY, STATE, COUNTY, ZIP CODE	NAME AND ADDRESS OF OWNER AND OPERATOR OF THE PLANT OR FACILITY IF OTHER THAN OFFEROR OR RESPONDENT
_____	_____
_____	_____

K.6 52.219-1 SMALL BUSINESS PROGRAM REPRESENTATIONS. (OCT 2000) -- ALTERNATE I (OCT 2000)

(a)(1) The standard industrial classification (NAICS) code for this acquisition is 541710.

(2) The small business size standard is less than 500.

(3) The small business size standard for a concern which submits an offer in its own name, other than on a construction or service contract, but which proposes to furnish a product which it did not itself manufacture, is 500 employees.

(b) Representations. (1) The offeror represents as part of its offer that it [ ] is, [ ] is not a small business concern.

(2) (Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision.) The offeror represents, for general statistical purposes, as part of its offer that it (__) is, (__) is not a small disadvantaged business concern as defined in 13 CFR 124.1002.

(3) (Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision.) The offeror represents as part of its offer that it [ ] is, [ ] is not a women-owned small business concern.

(4) [Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision.] The offeror represents as part of its offer that it [ ] is, [ ] is not a veteran-owned small business concern.

(5) [Complete only if the offeror represented itself as a veteran-owned small business concern in paragraph (b)(4) of this provision.] The offeror represents as part of its offer that it [ ] is, [ ] is not a service-disabled veteran-owned small business concern.

(6) [Complete only if offeror represented itself as a small business concern in paragraph (b)(1) of this provision.] The offeror represents, as part of its offer, that--

(i) It [ ] is, [ ] is not a HUBZone small business concern listed, on the date of this representation, on the List of Qualified HUBZone Small Business Concerns

maintained by the Small Business Administration, and no material change in ownership and control, principal office, or HUBZone employee percentage has occurred since it was certified by the Small Business Administration in accordance with 13 CFR Part 126; and

(ii) It [ ] is, [ ] is not a joint venture that complies with the requirements of 13 CFR Part 126, and the representation in paragraph (b)(6)(i) of this provision is accurate for the HUBZone small business concern or concerns that are participating in the joint venture. [The offeror shall enter the name or names of the HUBZone small business concern or concerns that are participating in the joint venture: _____.] Each HUBZone small business concern participating in the joint venture shall submit a separate signed copy of the HUBZone representation.

(c) Definitions. As used in this provision --

"Small business concern,", means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the criteria in 13 CFR Part 121 and the size standard in paragraph (a) of this provision.

"Service-disabled veteran-owned small business concern"--

(1) Means a small business concern--

(i) Not less than 51 percent of which is owned by one or more service-disabled veterans or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more service-disabled veterans; and

(ii) The management and daily business operations of which are controlled by one or more service-disabled veterans or, in the case of a veteran with permanent and severe disability, the spouse or permanent caregiver of such veteran.

(2) Service-disabled veteran means a veteran, as defined in 38 U.S.C. 101(2), with a disability that is service-connected, as defined in 38 U.S.C. 101(16).

"Women-owned small business concern," as used in this provision, means a small business concern -

(1) Which is at least 51 percent owned by one or more women or, in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more women; and

(2) Whose management and daily business operations are controlled by one or more women.

(d) Notice. (1) If this solicitation is for supplies and has been set aside, in whole or in part, for small business concerns, then the clause in this solicitation providing notice of the set-aside contains restrictions on the source of the end items to be furnished.

(2) Under 15 U.S.C. 645(d), any person who misrepresents a firm's status as a small HUBZone small, small disadvantaged, or women-owned small business concern in order to obtain a contract to be awarded under the preference programs established pursuant to section 8(a), 8(d), 9, or 15 of the Small Business Act or any other provision of Federal law that specifically references section 8(d) for a definition of program eligibility, shall --

(i) Be punished by imposition of fine, imprisonment, or both;

(ii) Be subject to administrative remedies, including suspension and debarment; and

(iii) Be ineligible for participation in programs conducted under the authority of the Act.

K.7 52.222-22 PREVIOUS CONTRACTS AND COMPLIANCE REPORTS. (FEB 1999)

The offeror represents that -

(a) It (__) has, (__) has not participated in a previous contract or subcontract subject to the Equal Opportunity clause of this solicitation;

(b) It (__) has, (__) has not filed all required compliance reports; and

(c) Representations indicating submission of required compliance reports, signed by proposed subcontractors, will be obtained before subcontract awards.

K.8 52.222-25 AFFIRMATIVE ACTION COMPLIANCE. (APR 1984)

The offeror represents that -

(a) It ___ has developed and has on file, ___ has not developed and does not have on file, at each establishment, affirmative action programs required by the rules and regulations of the Secretary of Labor (41 CFR 60-1 and 60-2); or

(b) It ___ has not previously had contracts subject to the written affirmative action programs requirement of the rules and regulations of the Secretary of Labor.

K.9 52.223-13 CERTIFICATION OF TOXIC CHEMICAL RELEASE REPORTING. (OCT 1996)

(a) Submission of this certification is a prerequisite for making or entering into this contract imposed by Executive Order 12969, August 8, 1995.

(b) By signing this offer, the offeror certifies that -

(1) As the owner or operator of facilities that will be used in the performance of this contract that are subject to the filing and reporting requirements described in section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) (42 U.S.C. 11023) and section 6607 of the Pollution Prevention Act of 1990 (PPA) (42 U.S.C. 13106), the offeror will file and continue to file for such facilities for the life of the contract the Toxic Chemical Release Inventory Form (Form R) as described in sections 313(a) and (g) of EPCRA and section 6607 of PPA; or

(2) None of its owned or operated facilities to be used in the performance of this contract is subject to the Form R filing and reporting requirements because each such facility is exempt for at least one of the following reasons: (*Check each block that is applicable*.)

___ (i) The facility does not manufacture, process, or otherwise use any toxic chemicals listed under section 313(c) of EPCRA, 42 U.S.C. 11023(c);

___ (ii) The facility does not have 10 or more full-time employees as specified in section 313(b)(1)(A) of EPCRA, 42 U.S.C. 11023(b)(1)(A);

___ (iii) The facility does not meet the reporting thresholds of toxic chemicals established under section 313(f) of EPCRA, 42 U.S.C. 11023(f) (including the alternate thresholds at 40 CFR 372.27, provided an appropriate certification form has been filed with EPA);

___ (iv) The facility does not fall within Standard Industrial Classification Code (SIC) designations 20 through 39 as set forth in section 19.102 of the Federal Acquisition Regulation; or

___ (v) The facility is not located within any State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the United States Virgin Islands, the Northern Mariana Islands, or any other territory or possession over which the United States has jurisdiction.

K.10 52.226-2 HISTORICALLY BLACK COLLEGE OR UNIVERSITY AND MINORITY INSTITUTION REPRESENTATION. (MAY 1997)

(a) Definitions. As used in this provision -

"Historically Black College or University" means an institution determined by the Secretary of Education to meet the requirements of 34 CFR 608.2. For the Department of Defense, the National Aeronautics and Space Administration, and the Coast Guard, the term also includes any nonprofit research institution that was an integral part of such a college or university before November 14, 1986.

"Minority Institution" means an institution of higher education meeting the requirements of Section 1046(3) of the Higher Education Act of 1965 (20 U.S.C. 1135d-5(3)) which, for the purpose of this provision, includes a Hispanic-serving institution of higher education as defined in Section 316(b)(1) of the Act (20 U.S.C. 1059c(b)(1)).

(b) Representation. The offeror represents that it -

___ is ___ is not a Historically Black College or University;

___ is ___ is not a Minority Institution.

K.11 52.230-1 COST ACCOUNTING STANDARDS NOTICES AND CERTIFICATION. (JUN 2000)

Note: This notice does not apply to small businesses or foreign governments. This notice is in three parts, identified by Roman numerals I through III.

Offerors shall examine each part and provide the requested information in order to determine Cost Accounting Standards (CAS) requirements applicable to any resultant contract.

If the offeror is an educational institution, Part II does not apply unless the contemplated contract will be subject to full or modified CAS coverage pursuant to 48 CFR 9903.201-2(c)(5) or 9903.201-2(c)(6), respectively.

I. DISCLOSURE STATEMENT - COST ACCOUNTING PRACTICES AND CERTIFICATION

(a) Any contract in excess of $500,000 resulting from this solicitation will be subject to the requirements of the Cost Accounting Standards Board (48 CFR Chapter 99), except for those contracts which are exempt as specified in 48 CFR 9903.201-1.

(b) Any offeror submitting a proposal which, if accepted, will result in a contract subject to the requirements of 48 CFR Chapter 99 must, as a condition of contracting, submit a Disclosure Statement as required by 48 CFR 9903.202. When required, the Disclosure Statement must be submitted as a part of the offeror's proposal under this solicitation unless the offeror has already submitted a Disclosure Statement disclosing the practices used in connection with the pricing of this proposal. If an applicable Disclosure Statement has already been submitted, the offeror may satisfy the requirement for submission by providing the information requested in paragraph (c) of Part I of this provision.

Caution: In the absence of specific regulations or agreement, a practice disclosed in a Disclosure Statement shall not, by virtue of such disclosure, be deemed to be a proper, approved, or agreed-to practice for pricing proposals or accumulating and reporting contract performance cost data.

(c) Check the appropriate box below:

[ ] (1) Certificate of Concurrent Submission of Disclosure Statement. The offeror hereby certifies that, as a part of the offer, copies of the Disclosure Statement have been submitted as follows:

(i) Original and one copy to the cognizant Administrative Contracting Officer (ACO) or cognizant Federal agency official authorized to act in that capacity (Federal official), as applicable; and

(ii) One copy to the cognizant Federal auditor.

(Disclosure must be on Form No. CASB DS-1 or CASB DS-2, as applicable. Forms may be obtained from the cognizant ACO or Federal official and/or from the loose-leaf version of the Federal Acquisition Regulation.)

Date of Disclosure Statement: _____ Name and Address of Cognizant ACO or Federal Official Where Filed: _____

The offeror further certifies that the practices used in estimating costs in pricing this proposal are consistent with the cost accounting practices disclosed in the Disclosure Statement.

[ ] (2) Certificate of Previously Submitted Disclosure Statement. The offeror hereby certifies that the required Disclosure Statement was filed as follows:

Date of Disclosure Statement: _____ Name and Address of Cognizant ACO or Federal Official Where Filed: _____

The offeror further certifies that the practices used in estimating costs in pricing this proposal are consistent with the cost accounting practices disclosed in the applicable Disclosure Statement.

[ ] (3) Certificate of Monetary Exemption. The offeror hereby certifies that the offeror, together with all divisions, subsidiaries, and affiliates under common control, did not receive net awards of negotiated prime contracts and subcontracts subject to CAS totaling $50 million or more in the cost accounting period immediately preceding the period in which this proposal was submitted. The offeror further certifies that if such status changes before an award resulting from this proposal, the offeror will advise the Contracting Officer immediately.

[ ] (4) Certificate of Interim Exemption. The offeror hereby certifies that (i) the offeror first exceeded the monetary exemption for disclosure, as defined in (3) of this subsection, in the cost accounting period immediately preceding the period in which this offer was submitted and (ii) in accordance with 48 CFR 9903.202-1, the offeror is not yet required to submit a Disclosure Statement. The offeror further certifies that if an award resulting from this proposal has not been made within 90 days after the end of that period, the offeror will immediately submit a revised certificate to the Contracting Officer, in the form specified

under subparagraph (c)(1) or (c)(2) of Part I of this provision, as appropriate, to verify submission of a completed Disclosure Statement.

Caution: Offerors currently required to disclose because they were awarded a CAS-covered prime contract or subcontract of $50 million or more in the current cost accounting period may not claim this exemption (4). Further, the exemption applies only in connection with proposals submitted before expiration of the 90-day period following the cost accounting period in which the monetary exemption was exceeded.

II. COST ACCOUNTING STANDARDS - ELIGIBILITY FOR MODIFIED CONTRACT COVERAGE

If the offeror is eligible to use the modified provisions of 48 CFR 9903.201-2(b) and elects to do so, the offeror shall indicate by checking the box below. Checking the box below shall mean that the resultant contract is subject to the Disclosure and Consistency of Cost Accounting Practices clause in lieu of the Cost Accounting Standards clause.

[ ] The offeror hereby claims an exemption from the Cost Accounting Standards clause under the provisions of 48 CFR 9903.201-2(b) and certifies that the offeror is eligible for use of the Disclosure and Consistency of Cost Accounting Practices clause because during the cost accounting period immediately preceding the period in which this proposal was submitted, the offeror received less than $50 million in awards of CAS-covered prime contracts and subcontracts. The offeror further certifies that if such status changes before an award resulting from this proposal, the offeror will advise the Contracting Officer immediately.

Caution: An offeror may not claim the above eligibility for modified contract coverage if this proposal is expected to result in the award of a CAS-covered contract of $50 million or more or if, during its current cost accounting period, the offeror has been awarded a single CAS-covered prime contract or subcontract of $50 million or more.

III. ADDITIONAL COST ACCOUNTING STANDARDS APPLICABLE TO EXISTING CONTRACTS

The offeror shall indicate below whether award of the contemplated contract would, in accordance with subparagraph (a)(3) of the Cost Accounting Standards clause, require a change in established cost accounting practices affecting existing contracts and subcontracts.

[ ] yes [ ] no

K.12 52.227-15 REPRESENTATION OF LIMITED RIGHTS DATA AND RESTRICTED COMPUTER SOFTWARE. (MAY 1999)

(a) This solicitation sets forth the work to be performed if a contract award results, and the Government's known delivery requirements for data (as defined in FAR 27.401). Any resulting contract may also provide the Government the option to order additional data under the Additional Data Requirements clause at 52.227-16 of the FAR, if included in the contract. Any data delivered under the resulting contract will be subject to the Rights in Data--General clause at 52.227-14 that is to be included in this contract. Under the latter clause, a Contractor may withhold from delivery data

that qualify as limited rights data or restricted computer software, and deliver form, fit, and function data in lieu thereof. The latter clause also may be used with its Alternates II and/or III to obtain delivery of limited rights data or restricted computer software, marked with limited rights or restricted rights notices, as appropriate. In addition, use of Alternate V with this latter clause provides the Government the right to inspect such data at the Contractor's facility.

(b) As an aid in determining the Government's need to include Alternate II or Alternate III in the clause at 52.227-14, Rights in Data--General, the offeror shall complete paragraph (c) of this provision to either state that none of the data qualify as limited rights data or restricted computer software, or identify, to the extent feasible, which of the data qualifies as limited rights data or restricted computer software. Any identification of limited rights data or restricted computer software in the offeror's response is not determinative of the status of such data should a contract be awarded to the offeror.

(c) The offeror has reviewed the requirements for the delivery of data or software and states [offeror check appropriate block] --

___ None of the data proposed for fulfilling such requirements qualifies as limited rights data or restricted computer software.

___ Data proposed for fulfilling such requirements qualify as limited rights data or restricted computer software and are identified as follows:

_____

_____

_____

Note: "Limited rights data" and "Restricted computer software" are defined in the contract clause entitled "Rights in Data--General."

K.13 COMPLIANCE WITH VETERANS EMPLOYMENT REPORTING REQUIREMENTS (JUNE 1999)

(a) The Offeror represents that, if it is subject to the reporting requirements of 38 U.S.C. 4212(d) (i.e. the VETS-100 report required by the Federal Acquisition Regulation clause 52.222-37, Employment Reports on Disabled Veterans and Veterans of the Vietnam Era), it has [ ], has not [ ] submitted the most recent report required by 38 U.S.C. 4212(d).

(b) An Offeror who checks “has not” may not be awarded a contract until the required reports are filed. (31 U.S.C. 1354)

K.14 52.227-6 ROYALTY INFORMATION. (APR 1984)

(a) Cost or charges for royalties. When the response to this solicitation contains costs or charges for royalties totaling more than $250, the following information shall be included in the response relating to each separate item of royalty or license fee:

(1) Name and address of licensor.

(2) Date of license agreement.

(3) Patent numbers, patent application serial numbers, or other basis on which the royalty is payable.

(4) Brief description, including any part or model numbers of each contract item or component on which the royalty is payable.

(5) Percentage or dollar rate of royalty per unit.

(6) Unit price of contract item.

7) Number of units.

(8) Total dollar amount of royalties.

(b) Copies of current licenses. In addition, if specifically requested by the Contracting Officer before execution of the contract, the offeror shall furnish a copy of the current license agreement and an identification of applicable claims of specific patents.

K.15 SIGNATURE/CERTIFICATION (MAR 1999)

By signing below, the offeror certifies, under penalty of law, that the representations and certifications are accurate, current, and complete. The offeror further certifies that it will notify the Contracting Officer of any changes to these representations and certifications. The representations and certification made by the offeror, as contained herein, concern matters within the jurisdiction of an agency of the United States and the making of a false, fictitious, or fraudulent representation or certification may render the maker subject to prosecution under Title 18, United States Code, Section 1001.

_____ _____

Signature of the Officer or Employee Date of Execution

Responsible for the Offer

_____

Typed Name and Title of the Officer or Employee

Responsible for the Offer

Name and Address of Organization:

_____

_____

_____

_____

Solicitation Number:_____

SECTION L - INSTRUCTIONS, CONDITIONS, AND NOTICES TO OFFERORS OR QUOTERS

L.1 CONSECUTIVE NUMBERING (JAN 1999)

Due to automated procedures employed in formulating this document, clauses and provisions contained within it may not always be consecutively numbered.

L.2 CONTENT OF RESULTING CONTRACT (NOV 1998)

Any contract awarded as a result of this PRDA will contain PART I - The Schedule, PART II - Contract Clauses, and PART III, Section J - List of Documents, Exhibits and Other Attachments (excluding those attachments including in this PRDA relating to submission of proposals). Blank areas appearing in these sections, indicated by "[TBD]" will be completed prior to contract award.

Offerors should carefully review the information contained therein, and, as appropriate, state any proposed exceptions/deviations per FAR 52.215-1.

L.3 RESPONSIBLE PROSPECTIVE CONTRACTORS (JUNE 1999)

All responsible individuals, corporations, non-profit organizations, educational institutions, and state or local governments may submit proposals for consideration. The general and additional minimum standards for responsible prospective Contractors set forth at FAR 9.1 apply.

DOE may conduct preaward surveys in accordance with FAR 9.106 and may solicit from available sources, relevant information concerning the offeror's record of past performance, and use such information in making determinations of prospective offeror responsibility.

L.4 INTENTION TO PROPOSE (MAR 1999)

To enable us to anticipate the number of submissions to be evaluated, please complete the information in the Intention to Propose form contained in [intent.wpd] and return to the addressee shown via mail, facsimile or e-mail, by the earliest practical date.

L.5 PARTICIPATION BY FEDERALLY FUNDED RESEARCH AND DEVELOPMENT CENTERS (FFRDC) AND DEPARTMENT OF ENERGY (DOE) MANAGEMENT AND OPERATIONS (M&O) CONTRACTORS (JAN 2001)

A. Proposed Use of a DOE M&O Contractor--Proposals submitted by, or substantially relying upon the technical expertise of, (1) another Federal agency; (2) a Federally Funded Research and Development Center (FFRDC) sponsored by a Federal agency; or (3) a Department of Energy (DOE) Management and Operating (M&O) contractor are not desired, will not be evaluated, and will not be eligible for an award under this solicitation. Offerors are encouraged to maximize the use of private sector organizations in the performance of the proposed effort. However, a proposal that includes performance by a FFRDC or DOE M&O contractor(s) may be considered for award, provided that: (1) the proposed use of any such entities is specifically authorized by the cognizant agency for the FFRDC or DOE for DOE M&O contractors, in accordance with the procedures established for the FFRDC or the DOE M&O contractor; (2) the work is not otherwise available from

the private sector; and (3) the estimated aggregate cost of the FFRDC or M&O contractor(s) work does not exceed 25 percent of the total estimated project cost. DOE reserves the right to fund the work through a DOE field work proposal or an interagency agreement. If so, DOE will not reimburse the prime contractor or higher-tiered subcontractor, for indirect costs (e.g. overhead and/or G&A) allocated to the FFRDC or M&O subcontract costs.

B. Proposal Submission Requirements -- In addition to the proposal information to be provided by the offeror as set forth in other parts of this Section L, the following requirements apply:

1. Justification -- The offeror shall submit a letter with its proposal (Volume I) which states that to the best of its knowledge, the work requested will not place the FFRDC or the DOE M&O contractor(s) in direct competition with the domestic private sector, and that the proposed scope of work cannot be performed by any private entity.

2. Work Scope -- The proposal must provide a detailed scope of work which clearly identifies that portion of the proposed effort to be performed by the offeror and a separate scope of work for the effort to be performed by the FFRDC or DOE M&O contractor(s). This detailed scope of work shall be provided as an appendix to the Volume II, Technical Proposal.

3. Cost Information -- The offeror shall provide cost information for that portion of the proposed work scope (see 2, above) to be performed by a FFRDC or DOE M&O contractor(s). The cost information shall be furnished in the same format and level of detail as prescribed for subcontractors. If a contractor uses an FFRDC or DOE M&O contractor to perform a portion of the work, the contractor's cost sharing shall be based on the total cost of the project, including both the contractor's and the FFRDC or DOE M&O's portions of the effort. The estimated cost of the effort shall be clearly identified in the Volume III, Cost Proposal.

4. Authorization from the DOE Contracting Officer -- The applicant must submit a document from the DOE Contracting Officer or authorized designee stating that the DOE M&O contractor is authorized to participate in the proposed effort."

L.6 52.215-1 INSTRUCTIONS TO OFFERORS--COMPETITIVE ACQUISITION. (FEB 2000)

(a) Definitions. As used in this provision--

"Discussions" are negotiations that occur after establishment of the competitive range that may, at the Contracting Officer's discretion, result in the offeror being allowed to revise its proposal.

"In writing" or "written" means any worded or numbered expression which can be read, reproduced, and later communicated, and includes electronically transmitted and stored information.

"Proposal modification" is a change made to a proposal before the solicitation's closing date and time, or made in response to an amendment, or made to correct a mistake at any time before award.

"Proposal revision" is a change to a proposal made after the solicitation closing date, at the request of or as allowed by a Contracting Officer as the result of negotiations.

"Time," if stated as a number of days, is calculated using calendar days, unless otherwise specified, and will include Saturdays, Sundays, and legal holidays. However, if the last day falls on a Saturday, Sunday, or legal holiday, then the period shall include the next working day.

(b) Amendments to solicitations. If this solicitation is amended, all terms and conditions that are not amended remain unchanged. Offerors shall acknowledge receipt of any amendment to this solicitation by the date and time specified in the amendment(s).

(c) Submission, modification, revision, and withdrawal of proposals. (1) Unless other methods (e.g., electronic commerce or facsimile) are permitted in the solicitation, proposals and modifications to proposals shall be submitted in paper media in sealed envelopes or packages (i) addressed to the office specified in the solicitation, and (ii) showing the time and date specified for receipt, the solicitation number, and the name and address of the offeror. Offerors using commercial carriers should ensure that the proposal is marked on the outermost wrapper with the information in paragraphs (c)(1)(i) and (c)(1)(ii) of this provision.

(2) The first page of the proposal must show--

(i) The solicitation number;

(ii) The name, address, and telephone and facsimile numbers of the offeror (and electronic address if available);

(iii) A statement specifying the extent of agreement with all terms, conditions, and provisions included in the solicitation and agreement to furnish any or all items upon which prices are offered at the price set opposite each item;

(iv) Names, titles, and telephone and facsimile numbers (and electronic addresses if available) of persons authorized to negotiate on the offeror's behalf with the Government in connection with this solicitation; and

(v) Name, title, and signature of person authorized to sign the proposal. Proposals signed by an agent shall be accompanied by evidence of that agent's authority, unless that evidence has been previously furnished to the issuing office.

(3) Submission, modification, revision, and withdrawal of proposals. (i) Offerors are responsible for submitting proposals, and any modifications or revisions, so as to reach the Government office designated in the solicitation by the time specified in the solicitation. If no time is specified in the solicitation, the time for receipt is 4:30 p.m., local time, for the designated Government office on the date that proposal or revision is due.

(ii)(A) Any proposal, modification, or revision received at the Government office designated in the solicitation after the exact time specified for receipt of offers is "late" and will not be considered unless it is received before award is made, the Contracting Officer determines that accepting the late offer would not unduly delay the acquisition; and--

(1) If it was transmitted through an electronic commerce method authorized by the solicitation, it was received at the initial point of entry to the Government infrastructure not later than 5:00 p.m. one working day prior to the date specified for receipt of proposals; or

(2) There is acceptable evidence to establish that it was received at the Government installation designated for receipt of offers and was under the Government's control prior to the time set for receipt of offers; or

(3) It is the only proposal received.

(B) However, a late modification of an otherwise successful proposal that makes its terms more favorable to the Government, will be considered at any time it is received and may be accepted.

(iii) Acceptable evidence to establish the time of receipt at the Government installation includes the time/date stamp of that installation on the proposal wrapper, other documentary evidence of receipt maintained by the installation, or oral testimony or statements of Government personnel.

(iv) If an emergency or unanticipated event interrupts normal Government processes so that proposals cannot be received at the office designated for receipt of proposals by the exact time specified in the solicitation, and urgent Government requirements preclude amendment of the solicitation, the time specified for receipt of proposals will be deemed to be extended to the same time of day specified in the solicitation on the first work day on which normal Government processes resume.

(v) Proposals may be withdrawn by written notice received at any time before award. Oral proposals in response to oral solicitations may be withdrawn orally. If the solicitation authorizes facsimile proposals, proposals may be withdrawn via facsimile received at any time before award, subject to the conditions specified in the provision at 52.215-5, Facsimile Proposals. Proposals may be withdrawn in person by an offeror or an authorized representative, if the identity of the person requesting withdrawal is established and the person signs a receipt for the proposal before award.

(4) Unless otherwise specified in the solicitation, the offeror may propose to provide any item or combination of items.

(5) Offerors shall submit proposals in response to this solicitation in English, unless otherwise permitted by the solicitation, and in U.S. dollars, unless the provision at FAR 52.225-17, Evaluation of Foreign Currency Offers, is included in the solicitation.

(6) Offerors may submit modifications to their proposals at any time before the solicitation closing date and time, and may submit modifications in response to an amendment, or to correct a mistake at any time before award.

(7) Offerors may submit revised proposals only if requested or allowed by the Contracting Officer.

(8) Proposals may be withdrawn at any time before award. Withdrawals are effective upon receipt of notice by the Contracting Officer.

(d) Offer expiration date. Proposals in response to this solicitation will be valid for the number of days specified on the solicitation cover sheet (unless a different period is proposed by the offeror).

(e) Restriction on disclosure and use of data. Offerors that include in their proposals data that they do not want disclosed to the public for any purpose, or used by the Government except for evaluation purposes, shall--

(1) Mark the title page with the following legend:

This proposal includes data that shall not be disclosed outside the Government and shall not be duplicated, used, or disclosed--in whole or in part--for any purpose other than to evaluate this proposal. If, however, a contract is awarded to this offeror as a result of--or in connection with--the submission of this data, the Government shall have the right to duplicate, use, or disclose the data to the extent provided in the resulting contract. This restriction does not limit the Government's right to use information contained in this data if it is obtained from another source without restriction. The data subject to this restriction are contained in sheets [insert numbers or other identification of sheets]; and

(2) Mark each sheet of data it wishes to restrict with the following legend:

Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal.

(f) Contract award. (1) The Government intends to award a contract or contracts resulting from this solicitation to the responsible offeror(s) whose proposal(s) represents the best value after evaluation in accordance with the factors and subfactors in the solicitation.

(2) The Government may reject any or all proposals if such action is in the Government's interest.

(3) The Government may waive informalities and minor irregularities in proposals received.

(4) The Government intends to evaluate proposals and award a contract without discussions with offerors (except clarifications as described in FAR 15.306(a)). Therefore, the offeror's initial proposal should contain the offeror's best terms from a cost or price and technical standpoint. The Government reserves the right to conduct discussions if the Contracting Officer later determines them to be necessary. If the Contracting Officer determines that the number of proposals that would otherwise be in the competitive range exceeds the number at which an efficient competition can be conducted, the Contracting Officer may limit the number of proposals in the competitive range to the greatest number that will permit an efficient competition among the most highly rated proposals.

(5) The Government reserves the right to make an award on any item for a quantity less than the quantity offered, at the unit cost or prices offered, unless the offeror specifies otherwise in the proposal.

(6) The Government reserves the right to make multiple awards if, after considering the additional administrative costs, it is in the Government's best interest to do so.

(7) Exchanges with offerors after receipt of a proposal do not constitute a rejection or counteroffer by the Government.

(8) The Government may determine that a proposal is unacceptable if the prices proposed are materially unbalanced between line items or subline items. Unbalanced pricing exists when, despite an acceptable total evaluated price, the price of one or more contract line items is significantly overstated or understated as indicated by the application of cost or price analysis techniques. A proposal may be rejected if the Contracting Officer determines that the lack of balance poses an unacceptable risk to the Government.

(9) If a cost realism analysis is performed, cost realism may be considered by the source selection authority in evaluating performance or schedule risk.

(10) A written award or acceptance of proposal mailed or otherwise furnished to the successful offeror within the time specified in the proposal shall result in a binding contract without further action by either party.

(11) The Government may disclose the following information in postaward debriefings to other offerors:

(i) The overall evaluated cost or price and technical rating of the successful offeror;

(ii) The overall ranking of all offerors, when any ranking was developed by the agency during source selection;

(iii) A summary of the rationale for award; and

(iv) For acquisitions of commercial items, the make and model of the item to be delivered by the successful offeror.

L.7 TIME, DATE AND PLACE PROPOSALS ARE DUE (JAN 2000)

The date and time for submission of proposals shall be NO LATER THAN April 10, 2001, 4:00 p.m., local prevailing time at the place designated for receipt of proposals. (See the proposal submission instructions, including the provision describing treatment of late submissions, modifications, and withdrawals of proposals.)

Proposal Submission by U.S. Mail

Proposals must be received at the following mailing address:

U. S. Department of Energy
National Energy Technology Laboratory
Attn: Ms. Deborah J. Boggs
3610 Collins Ferry Road, P.O. Box 880, M/S IO7
Morgantown, WV 26507-0880

Proposal Submission by other than U.S. Mail

Offerors electing to submit proposals by means other than the U.S. Mail, including commercial courier service, assume the full responsibility of insuring that proposals are received at the following hand-carry address by the date and time specified above:

U.S. Department of Energy
National Energy Technology Laboratory
Attn: Ms. Deborah J. Boggs
3610 Collins Ferry Road
Morgantown, WV 26507-0880

Such proposals must be closed and sealed as if for mailing.

External Marking of Proposals

Proposals shall be marked with the following information:

(1) Address of Proposer
(2) Solicitation Number: DE-RA26-01NT41013
(3) Due Time and Date of Proposals

L.8 NUMBER OF AWARDS (NOV 1997)

It is anticipated that there will be multiple awards resulting from this solicitation. However, the Government reserves the right to make any number of awards, or no award, if considered to be in the Government's best interest to do so.

L.9 52.216-1 TYPE OF CONTRACT. (APR 1984)

The Government contemplates awarding cost plus fixed fee contract(s) resulting from this solicitation.

L.10 ALTERNATE PROPOSAL INFORMATION - NONE (NOV 1997)

Alternate proposals are not solicited, are not desired, and shall not be evaluated.

L.11 FALSE STATEMENTS (NOV 1997)

Proposals must set forth full, accurate, and complete information as required by this solicitation (including attachments). The penalty for making false statements in proposals is prescribed in 18 U.S.C. 1001.

L.12 EXPENSES RELATED TO OFFEROR SUBMISSIONS (FEB 1998)

This solicitation does not commit the Government to pay any costs incurred in the submission of any proposal or in making necessary studies or designs for the preparation thereof or to acquire or contract for any services.

L.13 SMALL BUSINESS SIZE STANDARD AND SET-ASIDE INFORMATION (MAY 1999)

A fifteen percent set-aside is planned for small businesses.

L.14 AMENDMENT OF THE SOLICITATION (JAN 2000)

The only method by which any term of this solicitation may be modified is by an express, formal amendment to the solicitation generated by the issuing office. No other communication made at any scheduled preproposal conference or subsequent discussions, whether oral or in writing, will modify or supersede the terms of this

solicitation. All amendments to this RFP will be posted on the NETL Homepage at "http://www.netl.doe.gov/business/solicit/". Receipt of an amendment to a solicitation by an offeror must be acknowledged and received prior to the hour and date specified for receipt of offers.

L.15 CLASSIFIED MATERIAL - NONE (NOV 1997)

Performance under the proposed contract is not anticipated to involve access to classified material.

L.16 PROPOSAL PREPARATION INSTRUCTIONS -- GENERAL (MAR 1999)

To aid in evaluation, proposals shall be clearly and concisely written as well as being neat, indexed (cross-indexed as appropriate), and logically assembled. All pages of each part shall be appropriately numbered, and identified with the name of the offeror, the date, and the solicitation number to the extent practicable.

The proposal is to clearly and fully demonstrate the offeror's capability, knowledge, experience, and expertise with regard to the requirements described herein. Simply stating that the offeror understands and will comply with technical and management requirements is not adequate. Similarly, phrases such as "standard procedures will be employed" or "well-known techniques will be used" are also inadequate.

Overall Arrangement of Proposal

The overall proposal shall consist of 3 physically separate volumes, individually entitled as stated below. The required number of each proposal volume is shown below.

PROPOSAL VOLUME -- TITLE	ORIGINAL		COPIES	ELECTRONIC VERSION*	PAGE LIMITATION
Volume I -- Offer and Other Documents	1	+	5	None	None
Volume II -- Technical Proposal	1	+	5	Yes	40
Volume III - Cost Proposal	1	+	5	None	None

*Note: The electronic version of the technical proposal shall be submitted in WordPerfect 6.1 or Adobe Acrobat Portable Document Format on a 3.5" diskette or compact diskette.

The text of each proposal volume shall be typed, single-spaced, using Elite size (or equivalent, such as Times-Roman, Courier, or Arial), 12 pitch type (or equivalent), and printed, unreduced on size 8 1/2-inch by 11-inch paper. For interpretation of page limitation guidelines, the front and back of a single sheet are counted as two pages. Illustrations shall be legible and no longer than 11-inch by 17-inch fold-outs, as appropriate for the subject matter. Each 11-inch by 17-inch fold-out is considered two pages when determining the number of pages. Pages of each volume shall be sequentially numbered with the volume and page numbers on each page. Except as otherwise noted in the solicitation, the page guidelines set forth constitute a limitation on the total amount of material that may be submitted for evaluation. No material may be incorporated in any proposal by reference as a means to circumvent the page limitation.

Offerors are not to provide proposal information in three-ring binders, stapled copies are preferred.

L.17 PREPARATION INSTRUCTIONS: VOLUME I - OFFER AND OTHER DOCUMENTS (MAR 1999)

Volume I, Offer and Other Documents, consists of the actual offer to enter into a contract to perform the desired work, other documents requiring the signature of the offeror's authorized representative, and the offeror's description of its business and management approaches to satisfying the Statement of Work and its capability to perform the work.

FORMAT AND CONTENT

Volume I, Offer and Other Documents, shall include the following documents (in the order listed):

1. Supplemental Information Form (See Part III, Section J., Attachment G).

2. The SF33 Form -- Solicitation, Offer and Award (Page 1 of this solicitation)

(a) Offerors shall complete Blocks 12, 15A, 15B, 15C, 16, and sign in block 17. The SF33 is to be fully executed, including the acknowledgment of amendments, if applicable, and signed by an authorized individual of the proposing organization. Two signed originals shall be included.

(b) The offeror's Acceptance Period (See Block 12) entered shall not be less than 180 days.

(c) Signature Authority. The person signing the SF33 must have the authority to commit the offeror to all of the provisions of the proposal, fully recognizing that the Government has the right, by terms of the solicitation, to make an award without further discussion if it so elects.

3. Offeror Representations and Certifications Fully Executed

Offeror Representations and Certifications included under Section K of this solicitation are to be fully executed and a copy included in each copy of Volume I, Offer and Other Documents. As stated in Section K, should an offeror be selected for further negotiations, he must certify to the certifications referenced.

4. Supporting Data

The supporting data to be included in Volume I shall include all of the following information:

(a) The suitability of proposed teaming agreements among participants (including subcontractors).

(b) A discussion of the proposed involvement of qualified and capable small and small socially and economically disadvantaged business concerns. This section shall also contain the offerors commitment to, on request, submit and negotiate in good faith a Small and Small Disadvantaged Business Subcontracting Plan in accordance with FAR 52.219-9 of this solicitation.

5. Exceptions and Deviations

The offeror shall identify and explain any exceptions or deviations taken or conditional assumptions made with respect to the model contract, Offeror Representations and Certifications, and the requirements included in Volume I -- Offer and Other Documents, Volume II -- Technical Proposal and Volume III -- Cost Proposal. Any exceptions taken must contain sufficient justification to permit evaluation. The benefit to the Government shall be explained for each exception taken. Such exceptions will not, of themselves, automatically cause a proposal to be termed unacceptable. A large number of exceptions, or one or more significant exceptions not providing benefit to the Government, however, may result in rejection of your proposal(s) as unacceptable. Offerors who object to review of their proposal by persons other than Government employees shall so state this in Volume I page 1. Again, offerors are cautioned that DOE may be unable to give full consideration to proposals which indicate that only Government evaluation is authorized.

L.18 ENVIRONMENTAL, HEALTH, SAFETY AND SOCIETY IMPACT (MAR 1999)

Should the Offeror be selected for further negotiations leading to contract award, the Offeror will be required to submit a completed Environmental Assessment Questionnaire (see:nepafrm at this link (http://www.netl.doe.gov/business/index.html). This will be a detailed, self-contained document summarizing the proposed action, its alternatives, the existing environment, anticipated impacts from the project, and any regulatory compliance necessary. DOE shall use this questionnaire to evaluate the potential impacts of the proposed project, and at the earliest possible time, whether execution of the proposed activities will require an Environmental Assessment (EA), an Environmental Impact Statement (EIS), or can be covered under a Categorical Exclusion (CX). If the environmental impacts are considered significant, the selectee, prior to award, will be required to prepare the Environmental Compliance Plan, an Environmental Monitoring Plan, and Environmental Report. Contract award will be made after the environmental material submitted by the respective contractor has been reviewed and accepted by DOE.

L.19 52.204-6 DATA UNIVERSAL NUMBERING SYSTEM (DUNS) NUMBER. (JUN 1999)

(a) The offeror shall enter, in the block with its name and address on the cover page of its offer, the annotation "DUNS" followed by the DUNS number that identifies the offeror's name and address exactly as stated in the offer. The DUNS number is a nine-digit number assigned by Dun and Bradstreet Information Services.

(b) If the offeror does not have a DUNS number, it should contact Dun and Bradstreet directly to obtain one. A DUNS number will be provided immediately by telephone at no charge to the offeror. For information on obtaining a DUNS number, the offeror, if located within the United States, should call Dun and Bradstreet at 1-800-333-0505. The offeror should be prepared to provide the following information:

(1) Company name.

(2) Company address.

(3) Company telephone number.

(4) Line of business.

(5) Chief executive officer/key manager.

(6) Date the company was started.

(7) Number of people employed by the company.

(8) Company affiliation.

(c) Offerors located outside the United States may obtain the location and phone number of the local Dun and Bradstreet Information Services office from the Internet home page at http://www.customerservice@dnb.com/. If an offeror is unable to locate a local service center, it may send an e-mail to Dun and Bradstreet at globalinfo@mail.dnb.com.

L.20 PREPARATION INSTRUCTIONS: VOLUME II - TECHNICAL PROPOSAL (OCT 2000)

Volume II - Technical Proposal will be used to assess both the scientific merit of the proposed work and its relevance to both DOE's current programmatic objectives and the objectives of this solicitation (see Part I, Section J, Attachment A). The technical proposal must be self-contained and written in a clear and concise manner. The proposal shall be definitive with respect to the research which the offeror actually proposes to conduct. If the proposal is selected for comprehensive evaluation, the criteria specified in Section M shall be applied.

The maximum number of pages for the Technical Proposal shall be limited to 40 pages. For interpretation of page guidelines, reference the clause L.16 entitled, "Proposal Preparation Instructions -- General". Note that the Cover Sheet, Resumes, Public Abstract, and Table of Contents are not included in the page limitation.

To ensure that the technical proposal is evaluated strictly on its own merit, no cost information shall be included.

FORMAT AND CONTENT

The offeror shall include a technical discussion in the format specified below. This format relates to the technical evaluation criteria found in Section M. Alternate heading names and additional headings may be included as desired.

1. Cover Sheet. A completed and signed cover sheet as per FAR 52.215-1 shall be used. The title of the proposed effort should be concise and descriptive of the work to be performed.

2. Public Abstract. A concise public abstract of no more than one (1) typewritten page clearly stating the objectives of the proposed research, the title of the project, methodology, and sponsoring organization(s) shall be included. The abstract is to provide an overview of the proposed project objectives. It is a stand-alone document. This abstract may be released to the public by DOE in whole or in part at anytime. It is therefore required that it shall not contain proprietary data or confidential business information. The offeror shall indicate a point of contact for coordination, preparation and distribution of press releases.

3. Table of Contents. In order to produce a comprehensive proposal for this solicitation, the offeror should address, at a minimum, the areas listed below. To help facilitate the review process and to ensure addressing all the review criteria, the offeror shall use the following Table of Contents when preparing the technical application.

Page

(This section shall contain the major portion of the Technical Proposal. It shall clearly address each of the Technical Proposal evaluation criteria in Part IV -- Section M, and at a minimum cover the factors listed below:)

≤ 40 pages

4. Technical Discussion. This section shall contain the major portion of the Technical Proposal. It shall clearly address each of the Technical Proposal evaluation criteria in Part IV -- Section M. and at a minimum cover the factors listed below.

A. UNDERSTANDING OF OBJECTIVES AND APPLICABILITY TO DOE NEEDS

The offeror shall provide a project objective (s), background and description of the innovative or improved technology, and its intended use(s) in DOE applications.

The offeror shall provide a discussion which clearly reflects their understanding of the specific Department of Energy (DOE) need(s) or problem(s) being addressed and the deficiencies of current technologies and feasibility of offeror's technology to overcome the deficiencies.

The offeror shall discuss the stage of development (consistent with Attachment F of this solicitation) of the proposed technology or concept.

The offeror shall provide a clear description of the project objective(s) and expected performance of the equipment, device, or process and the potential benefits of the proposed innovative or improved technology in terms of anticipated performance and/or cost savings over potential baseline technologies. Supporting performance data and cost advantages (in terms of percentages) information shall be provided to substantiate the claims of benefits.

The offeror shall discuss the prior use, research, development or application of the proposed technology and appropriateness of how the prior work relates to the proposed application of the technology.

The offeror shall provide a discussion of the applicability of the innovative/improved technology to address multiple needs at multiple DOE facilities, and the potential DOE complex-wide benefits of the innovative/improved technology relative to cost savings and safety benefits.

B. TECHNICAL APPROACH

The offeror shall discuss its proposed approach for research and development of the innovative or improved technology/concept including identification of relevant technical, regulatory, environmental, economic, production, or other significant issues.

The offeror shall provide a discussion of the potential technical issues and proposed resolution for the research and development of the proposed technology, concept or process.

The offeror shall provide a Statement of Work (SOW) which divides the work into logical tasks and subtasks necessary to accomplish the project objective(s). The SOW shall be included in Appendix A and shall be prepared in accordance with guidance in paragraph 5 of this provision not exceeding 3 pages in length; it will count toward the 40-page technical proposal limitation. The offeror shall provide a clear description of the work to be performed under each task. The SOW shall be written in active voice and shall contain necessary and sufficient information to estimate the cost of the work.

The offeror shall discuss the preliminary test plan and other logistics of the proposed work as approprate.

The offeror shall provide a table listing the estimated labor hours and labor categories (e.g., engineering, manufacturing, scientific, technician, analytical, clerical) required for the proposed work. It is not sufficient to merely indicate a certain number of hours; a determination as to why that number of hours is required. In addition, the hours shall be related to the specific tasks to be performed and, as far as possible, shall indicate the job disciplines and classifications (engineering, manufacturing, scientific) under each task. The offeror shall detail labor hours and labor categories for any proposed subcontracting or consulting effort for each task. It should also indicate the extent to which the offeror has previously worked with the proposed consultant or subcontractor. Again, no pricing information shall be included in the Technical Proposal. The offeror shall explain the purpose of the subcontract or consulting effort.

The offeror shall clearly discuss environmental, safety and health impacts associated with the proposed technical approach and specific project site(s).

C. CAPABILITIES, COMMITMENT, AND ORGANIZATIONAL EXPERIENCE

The offeror shall describe relevant technical and management experience, availability of proposed personnel on the project including subcontractors, and prior experience in managing projects similar in type, technology, size, and complexity.

The offeror shall provide a project organization structure and the lines of authority, both technical and administrative. Resumes of key personnel should be provided and included in Appendix B.

The offeror shall discuss the commitment to develop and test innovative/improved technology.

The offeror shall discuss the motivation of the organization for being involved in the proposed effort including plans and commitment to commercialize and deploy the technology as appropriate to the maturation level of the proposed technology

The offeror shall discuss any outside commitments which might conflict with performance of this project. The offeror shall indicate their degree of ownership and control of the technology.

The offeror shall discuss the availability of permits required to support the project.

The offeror shall provide evidence that they are certified to work with potentially hazardous and radioactive material and wastes and have performance experience.

D. FACILITIES AND EQUIPMENT

The offeror shall discuss the availability of the equipment and appropriate facility to perform the intended work.

The offeror shall discuss the existence of any licenses, patents, royalties, or intellectual property rights which could impact future use of the technology by DOE and others.

The offeror shall discuss in detail the required purchases of any capital equipment, materials, and supplies and provide a justification.

5. Statement of Work Appendix A: Instructions for Preparing the Statement of Work (NOV2000)

All proposals must contain a single, detailed Statement of Work that addresses how the project objectives will be met. The Statement of Work must contain a clear, concise description of all activities to be completed during project performance and follow the structure discussed below.

Offerors shall prepare the Statement of Work in the following format:

TITLE OF WORK TO BE PERFORMED

(Insert title of work to be performed. Be concise and descriptive.)

A. OBJECTIVES

Include one paragraph on the overall objective(s) of the work. Also, include objective(s) for each phase of the work.

B. SCOPE OF WORK

This section should not exceed one-half page and should summarize the effort and approach to achieve the objective(s) of the work for each Phase.

C. TASKS TO BE PERFORMED

Tasks, concisely written, should be provided in a logical sequence and should be divided into the phases of the project. This section provides a brief summary of the planned approach to this project.

PHASE I

Task 1.0 - (Title)

(Description)

Subtask 1.1

(Description)

Task 2.0 - (Title)

PHASE II

Task 3.0 - (Title)

D. DELIVERABLES

The periodic, topical, and final reports shall be submitted in accordance with the "Reporting Requirements Checklist" and the instructions accompanying the checklist.

The Contractor shall provide a list of deliverables other than those identified on the "Reporting Requirements Checklist" that will be delivered. These reports shall also be identified within the text of the Statement of Work, for example:

1. Task 1.1 - (Report Description)

2. Task 2.2 - (Report Description);

and specifically:

- A project management plan developed by the contractor, and approved by the DOE-COR, host site, and its M&O/M&I contractor, must be in place before a demonstration can occur at a DOE site. This plan must clearly delineate who has responsibilities for all activities involved with the demonstration at the DOE site (i.e., health and safety, site support, utilities, industrial hygiene, radiation protection, bulk material, subcontracts, storage and disposal of investigative derived waste, mobilization/demobilization, etc.) and the costs that are

involved. This activity should be closely coordinated with the DOE-COR and no action shall be initiated until the DOE-COR is notified and has approved it.

- A plan for commercialization must also be developed for all technologies leading to demonstration or deployment, clearly showing the commitment of the developer to take the technology beyond demonstration to multiple deployments. This would be evidenced by an analysis of the DOE and non-DOE market for the technology, an estimate of the production scale costs upon commercialization, and an analysis of the regulatory acceptance of the technology.

- If the technology is demonstrated on a DOE site, an Innovative Technology Summary Report (ITSR) must be developed using the performance verification data gathered in the demonstration and earlier project phases. Guidance on how to develop the ITSR is found at http://ost.em.doe.gov/GuidITSRs.htm. Please note that a critical element in this document is the cost savings estimate, which will be required of the contractor. The conractor is expected to address questions concerning the ITSR and the data used to develop it.

E. BRIEFINGS/TECHNICAL PRESENTATIONS (If applicable)

The Contractor shall prepare detailed briefings for presentation to the COR at the COR's facility located in Pittsburgh, PA or Morgantown, WV. Briefings shall be given by the Contractor to explain the plans, progress, and results of the technical effort at 2 meetings per year at NETL's Morgantown or Pittsburgh sites.

The Contractor shall provide and present a technical paper(s) at the DOE/NETL Annual Contractor's Review Meeting to be held at the NETL facility located in Pittsburgh, PA or Morgantown, WV.

6. Resumes.

7. Pertinent Publications.

L.21 PREPARATION INSTRUCTIONS: VOLUME III - COST PROPOSAL(Nov 2000)

Cost proposals should be prepared according to the instructions provided at http://www.netl.doe.gov/business/forms/cost_rfp.html

L.22 52.215-20 REQUIREMENTS FOR COST OR PRICING DATA OR INFORMATION OTHER THAN COST OR PRICING DATA. (OCT 1997) -- ALTERNATE I (OCT 1997)

(a) Exceptions from cost or pricing data.

(1) In lieu of submitting cost or pricing data, offerors may submit a written request for exception by submitting the information described in the following subparagraphs. The Contracting Officer may require additional supporting information, but only to the extent necessary to determine whether an exception should be granted, and whether the price is fair and reasonable.

(i) Identification of the law or regulation establishing the price offered. If the price is controlled under law by periodic rulings, reviews, or similar actions of a governmental body, attach a copy of the controlling document, unless it was previously submitted to the contracting office.

(ii) Commercial item exception. For a commercial item exception, the offeror shall submit, at a minimum, information on prices at which the same item or similar items have previously been sold in the commercial market that is adequate for evaluating the reasonableness of the price for this acquisition. Such information may include--

(A) For catalog items, a copy of or identification of the catalog and its date, or the appropriate pages for the offered items, or a statement that the catalog is on file in the buying office to which the proposal is being submitted. Provide a copy or describe current discount policies and price lists (published or unpublished), e.g., wholesale, original equipment manufacturer, or reseller. Also explain the basis of each offered price and its relationship to the established catalog price, including how the proposed price relates to the price of recent sales in quantities similar to the proposed quantities;

(B) For market-priced items, the source and date or period of the market quotation or other basis for market price, the base amount, and applicable discounts. In addition, describe the nature of the market;

(C) For items included on an active Federal Supply Service Multiple Award Schedule contract, proof that an exception has been granted for the schedule item.

(2) The offeror grants the Contracting Officer or an authorized representative the right to examine, at any time before award, books, records, documents, or other directly pertinent records to verify any request for an exception under this provision, and the reasonableness of price. For items priced using catalog or market prices, or law or regulation, access does not extend to cost or profit information or other data relevant solely to the offeror's determination of the prices to be offered in the catalog or marketplace.

(b) Requirements for cost or pricing data. If the offeror is not granted an exception from the requirement to submit cost or pricing data, the following applies:

(1) The offeror shall submit cost or pricing data and supporting attachments in the following format:

(2) As soon as practicable after agreement on price, but before contract award (except for unpriced actions such as letter contracts), the offeror shall submit a Certificate of Current Cost or Pricing Data, as prescribed by FAR 15.406-2.

L.23 INFORMATION OF AWARD (NOV 1997)

Written notice to unsuccessful offerors and contract award information will be promptly released in accordance with DOE regulations applicable to negotiated acquisitions.

L.24 DISPOSITION OF SOLICITATION MATERIALS AND PROPOSALS (FEB 1998)

Drawings, specifications, and other documents supplied with the solicitation may be retained by the offeror (unless there is a requirement for a document to be completed and returned as a part of the offer).

Offeror's Proposals will not be returned (except for timely withdrawals).

L.25 52.233-2 SERVICE OF PROTEST. (AUG 1996)

(a) Protests, as defined in section 33.101 of the Federal Acquisition Regulation, that are filed directly with an agency, and copies of any protests that are filed with the General Accounting Office (GAO), shall be served on the Contracting Officer , D. Denise Riggi, by obtaining written and dated acknowledgment of receipt from U.S. Department of Energy, National Energy Technology Laboratory, Acquisition and Assistance Division, NETL, P.O. Box 880, Morgantown, WV 26507-0880.

(b) The copy of any protest shall be received in the office designated above within one day of filing a protest with the GAO.

L.26 952.233-2 SERVICE OF PROTEST. (APR 1995)

(c) Another copy of a protest filed with the General Accounting Office shall be furnished to the following address within the time periods described in paragraph (b) of this clause: U.S. Department of Energy, Assistant General Counsel for Procurement and Financial Assistance (GC-61), 1000 Independence Avenue, S.W., Washington, DC 20585 Fax: (202) 586-4546.

L.27 952.233-4 NOTICE OF PROTEST FILE AVAILABILITY. (SEP 1996)

(a) If a protest of this procurement is filed with the General Accounting Office (GAO) in accordance with 4 CFR Part 21, any actual or prospective offeror may request the Department of Energy to provide it with reasonable access to the protest file pursuant to FAR 33.104(a)(3)(ii), implementing section 1065 of Public Law 103-355. Such request must be in writing and addressed to the contracting officer for this procurement.

(b) Any offeror who submits information or documents to the Department for the purpose of competing in this procurement is hereby notified that information or documents it submits may be included in the protest file that will be available to actual or prospective offerors in accordance with the requirements of FAR 33.104(a)(3)(ii). The Department will be required to make such documents available unless they are exempt from disclosure pursuant to the Freedom of Information Act. Therefore, offerors should mark any documents as to which they would assert that an exemption applies. (See 10 CFR part 1004.)

L.28 952.233-5 AGENCY PROTEST REVIEW. (SEP 1996)

Protests to the Agency will be decided either at the level of the Head of the Contracting Activity or at the Headquarters level. The Department of Energy's agency protest procedures, set forth in 933.103, elaborate on these options and on the availability of a suspension of a procurement that is protested to the agency. The Department encourages potential protesters to discuss their concerns with the contracting officer prior to filing a protest.

L.29 952.227-84 NOTICE OF RIGHT TO REQUEST PATENT WAIVER. (FEB 1998)

Offerors have the right to request a waiver of all or any part of the rights of the United States in inventions conceived or first actually reduced to practice in performance of the contract that may be awarded as a result of this solicitation, in advance of or within 30 days after the effective date of contracting. Even where such advance waiver is not requested or the request is denied, the contractor will have a continuing right under the contract to request a waiver of the rights of the United States in identified inventions, i.e., individual inventions conceived or first actually reduced to practice in performance of the contract. Domestic small businesses and domestic nonprofit organizations normally will receive the patent rights clause at DEAR 952.227-11 which permits the contractor to retain title to such inventions, except under contracts for management or operation of a Government-owned research and development facility or under contracts involving exceptional circumstances or intelligence activities. Therefore, small businesses and nonprofit organizations normally need not request a waiver. See the patent rights clause in the draft contract in this solicitation. See DOE's patent waiver regulations at 10 CFR part 784.

SECTION M--EVALUATION FACTORS FOR AWARD

M.1. GENERAL

Proposals will be evaluated in accordance with applicable DOE acquisition policies and procedures. The proposal preparation instructions contained in Section L of this solicitation are designed to provide guidance to the offeror concerning the criteria that will be used to evaluate proposals.

Award will be made to the responsible offeror(s), whose offer(s), conforming to this PRDA, is (are) considered most advantageous to the Government, considering the Evaluation Criteria in this Section M.

The Government may award a contract on the basis of initial offers received, without discussions. Therefore, each initial offer should contain the offeror's best terms from cost or price and technical standpoint.

M.2 OVERALL RELATIVE IMPORTANCE OF EVALUATION CRITERIA (NOV 1997)

The technical proposal is of greater importance than the cost proposal. The Offer and Other Documents volume of the proposal is to be evaluated for adequacy and compliance with the solicitation.

M.3 EVALUATION (PRDA) (FEB 2001)

Evaluation and selection of proposals will consist of a preliminary review, a comprehensive evaluation with final ranking, and application of program policy factors.

M.4 PRELIMINARY REVIEW (PRDA) (FEB 2001)

Proposals will receive a preliminary review to determine that the proposal contains sufficient technical, cost, and other required information to enable comprehensive evaluation and has been signed by a responsible official of the proposing organization or person authorized to obligate such organization.

If the proposal does not meet these requirements, a comprehensive evaluation shall not be made. In such case, a prompt notice shall be sent to the offeror indicating the reason(s) for its not being selected for a comprehensive evaluation.

M.5 COMPREHENSIVE EVALUATION (PRDA) (FEB 2001)

The basic task in the evaluation and selection of proposals for award or support is to assess the relative merit to determine which proposal(s) offers the greatest likelihood for achievement of the PRDA objectives. Technical quality, ability of the proposer, estimated cost, and other relevant factors are considered.

Proposals passing the preliminary review shall be evaluated in accordance with the evaluation criteria below.

M. 6 TECHNICAL EVALUATION CRITERIA (PRDA) (FEB 2001)

The following criteria will be considered in the comprehensive evaluation of technical proposals submitted in response to this PRDA. The technical evaluation criteria are listed in descending order of importance. The relative weights of each criterion are indicated beside each criterion.

EVALUATION CRITERIA 1 --Understanding of Objectives and Applicability to DOE Needs (35%)

Soundness of offeror's understanding of the Department of Energy (DOE) Focus Area need(s) or problem(s) being addressed.

(1a) Soundness of the offeror's understanding of the overall PRDA objectives, and of the issues, needs, and problems defined in the proposed research area; understanding, extent of knowledge, and completeness and accuracy of comparison of current technologies if available, with the proposed technology; understanding of potential advantages, benefits and improvements of the proposed technology over current, commercial, and emerging technologies; and, understanding of deficiencies of current technologies and feasibility of offeror's technology to overcome the deficiencies.

(1b) Applicability of the proposed technology to one or more DOE sites; and understanding of the site characteristics necessary or desirable for use of the proposed technology.

(1c) Extent of prior use, research, development or application of the proposed technology and appropriateness of how the prior work relates to the proposed application of the technology.

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EVALUATION CRITERIA 2 -- Technical Approach (35%)

(2a) Completeness and appropriateness of discussion regarding potential technical, regulatory, environmental, economic, production or other issues to be addressed by the technical approach; soundness of scientific and engineering rationale; applicability of the proposed technology to the proposed research area; soundness and completeness of the Statement of Work (SOW) and technical approach for all phases; appropriateness and clarity of success criteria; and soundness and completeness of preliminary test plan. Identification of potential issues and reasonableness of proposed resolution of the issues.

(2b) Reasonableness and appropriateness of schedule, milestones, proposed labor hours, labor categories, travel, consultants, and subcontractors.

(2c) Extent of available environmental information on the technical approach and project site(s); and significance of potential environmental, safety, and health impacts.

EVALUATION CRITERIA 3. Capabilities, Commitment, and Organizational Experience (20%)

(3a) Extent and appropriateness of qualifications, and technical and managerial experience of the proposed personnel, subcontractors, and consultants; capabilities of project organization including technical knowledge, access to financial and technical resources, and project

management abilities; and prior experience in managing projects similar in type, technology, size and complexity; and prior experience in obtaining permits and licenses and in dealing with environmental laws and regulations. Extent of training to work with radioactive or hazardous materials.

(3b) Motivation of organization for being involved in proposed effort; priority of proposed effort relative to other commitments; commitment to deployment and commercialization and completeness and soundness of plans for commercialization; and extent of existing licenses, patents, royalties, or intellectual property rights of the proposed technology.

(3c) Soundness and completeness of project organizational structure; identification of key personnel's functions and responsibilities; and availability and time commitments of proposed personnel.

EVALUATION CRITERIA 4 -- Facilities and Equipment (10%)

The completeness, appropriateness and availability of proposed equipment, materials, and facilities; reasonableness of justification for purchase or lease of facilities, equipment, or materials; and, extent of existing permits and licenses related to operation of facilities. Existence of appropriate permits to work with the materials of concern in the proposed work.

M.7 COST

The cost proposal will not be point scored, assigned a numerical weight or adjectivally rated. The costs proposed (including any phases) will be evaluated in accordance with the following criteria which are of equal weight:

- Reasonableness and appropriateness of cost.
- Evaluated probable cost to the Government.
- Extent of Cost Participation, if applicable.

M.8 APPLICATION OF PROGRAM POLICY FACTORS AND SELECTION (OCT 1998)

These factors, while not indicators of the proposal's merit, e.g., technical excellence, cost, proposer's ability, etc., may be essential to the process of selecting the proposal(s) that, individually or collectively, will best achieve the program objectives. Such factors are often beyond the control of the offeror. Proposers should recognize that some very good proposals may not receive an award because they do not fit within a mix of projects which maximizes the probability of achieving the DOE's overall research and development objectives. Therefore, the following Program Policy Factors may be used by the Source Selection Official to assist in determining which of the ranked proposal(s) shall receive DOE funding support.

- It may be desirable to select project(s) for award of less technical merit than other project(s) if such a selection will optimize use of available funds, and distribute funds and projects among a larger number of research areas.
- It may be desirable to select project(s) for award which initiate work at higher Gate levels and exhibit higher potential for expedient implementation.
- It may be desirable to select project(s) for award which will be applicable to multiple DOE sites.
- It may be desirable to select project(s) for award that represent a diversity of methods, approaches, or application of differing technology options.

- It may be desirable to select project(s) for award which minimize issues regarding siting, environmental permitting and the impact of regulatory issues.
- It may be desirable to select project(s) for award which represent a diversity of organizations (i.e., small businesses, educational institutions).
- It may be desirable to select project(s) for award which maximize the return on investment of previous Government funding.

The above factors may be independently considered by the Source Selection Official in determining the optimum mix of proposals that will be selected for support. These policy factors will provide the Source Selection Official with the capability of developing, from the competitive procurement, a broad involvement of organizations and organizational ideas, which both enhance the overall technology research effort and upgrade the program content to meet the goals of the DOE.

M 9. SELECTION

The Source Selection Official will select a mix of proposals for award from the finding(s) established by the proposal evaluation panel. The Source Selection Official will take into account the relative technical, environmental, and cost evaluation results as well as applicable program policy factors in determining which proposal(s) will best satisfy program objectives.

M 10. EVALUATION OF PHASES

1. The government will evaluate offers for award purposes by adding the total price for all phases to the total price for the basic requirement. Evaluation of the subsequent phase(s) will not obligate the Government to pursue the subsequent phase(s).

2. The criteria for evaluation of technical proposals will apply to the entire Statement of Work to assure that selected offer(s) have the requisite technical, management and financial capacity to compete for and perform all phases. Both the basic program and any phases proposed shall be technically evaluated simultaneously as one comprehensive technical proposal.

INTENTION TO PROPOSE

SOLICITATION NUMBER: DE-RA26-01NT41013

WE _____ DO _____ DO NOT INTEND TO SUBMIT A PROPOSAL.

NAME AND ADDRESS OF FIRM OR ORGANIZATION (INCLUDING ZIP CODE)

_____

_____

_____

_____
AUTHORIZED SIGNATURE (Optional for E-Mail Responses)

_____

_____
TYPED OR PRINTED NAME AND TITLE

_____
DATE

_____
TELEPHONE NO.

_____
FACSIMILE NO.

_____
E-MAIL ADDRESS

Please return this form to:

MAIL TO: U. S. Department of Energy
National Energy Technology Laboratory
ATTN: Ms. Deborah J. Boggs
P.O. Box 880
3610 Collins Ferry Road
Morgantown, WV 26507-0880

VIA FACSIMILE: (304)285-4683
VIA E-MAIL: dboggs@netl.doe.gov